

# The Climate Institute



**Coalition Climate Policy**  
and the National Climate Interest

---

# Coalition Climate Policy and the National Climate Interest

---

---

## Policy Brief

August 2013

## Contents

Summary	3
Introduction	7
Climate Policy – The Coalition’s Position	9
Cutting Pollution, Boosting Investment – Modelling Results	21
Discussion – Questions of Scale, Diplomacy and Transformation	36
Conclusions – Delivering the National Climate Interest	40

### Cover Image:

Michael Hall, Creative Fellow  
of The Climate Institute



### Acknowledgements

This policy brief was developed by Erwin Jackson with key inputs from Corey Watts, Olivia Kember and John Connor. We also thank Amandine Denis and Anna Skarbek for their input on the modelling exercise and policy assumptions. The views expressed in this policy brief remain those of The Climate Institute.

# Summary

This policy brief outlines the results of an analysis of both the Government's legislated policies and a range of approaches the Coalition could take to implement its policy platform. This analysis is based in large part on detailed modelling undertaken by SKM-MMA and Monash University's Centre of Policy Studies (CoPS).

The Coalition is yet to announce details of key elements of its policy. To capture a range of possible policy options a number of scenarios were evaluated, including weakening or strengthening the Renewable Energy Target, changing the way large emitters are penalised for exceeding emission baselines, or giving firms access to international markets to achieve emission reductions. The modelling is based on a number of conservative assumptions about how the policy will work in practice and will therefore likely overestimate the emission reductions that can be achieved under the Coalition's policy.

The Coalition supports net Australian emission reductions of 5 to 25 per cent on 2000 levels by 2020. The Coalition has supported the conditions for strengthening targets above the unconditional 5 per cent target and given in-principle support to new international commitments under the Kyoto Protocol. The Coalition also supports the global goal of avoiding a 2°C increase in mean global temperature above pre-industrial levels.

This goal can be understood as 'Australia's national climate interest' in recognition that Australia is an advanced economy that is particularly vulnerable to the impacts of climate change.

A number of reviews of the Coalition's policy by Ernst and Young, the law firm Allens, Treasury and others, have identified several potential weaknesses in the proposed policy framework. In particular, concerns have been raised by industry and economic analysts that there is considerable uncertainty as to whether the policy can achieve its stated goal of achieving at least a 5 per cent reduction of emissions on 2000 levels by 2020. Experts have noted that the policy creates significant uncertainty for business over the medium and long-term, that administrative costs will be high and that, in the absence of a carbon price, other measures such as the Renewable Energy Target will have to play a greater role in emission reductions.

Domestic and international experiences generally support these conclusions, as mechanisms of the nature proposed by the Coalition have not driven substantial absolute emissions reductions to date.

The modelling by SKM MMA and CoPS finds that:

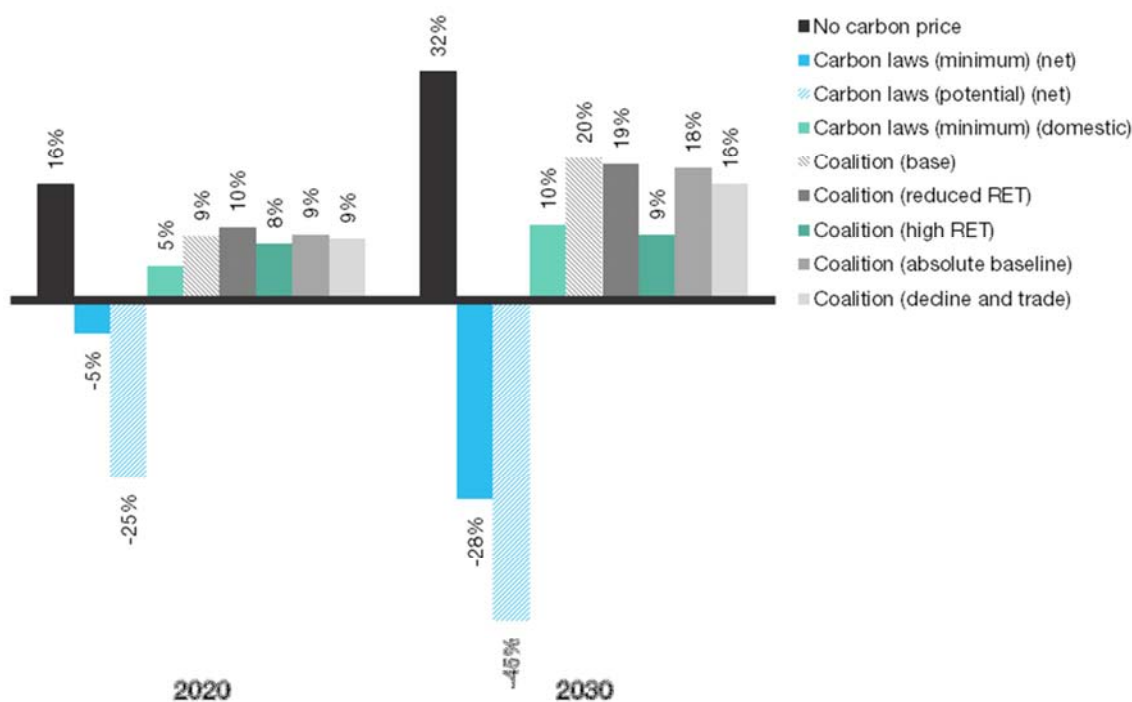
- + **Under all Coalition scenarios Australia's emissions continue to increase to 2020 and beyond.** Additional emissions range from +8 to +10 per cent above 2000 levels by 2020. This is the equivalent of doubling Australia's car fleet over this period. Even with ongoing and increasing budgetary outlays in the order of \$88 billion dollars from 2014 to 2050, emissions continue to rise by around 45 per cent over this timeframe. Domestic emissions under the Government scenarios increase to a lesser extent but the increase is offset by the use of international emissions units to meet our international obligations.

- + **The Government's minimum-target carbon laws drive substantially more domestic emission reductions than the Coalition's policy scenarios.** To 2020, the domestic emission reductions achieved under the current carbon and clean energy laws are around 40 per cent stronger than those achieved under the Coalition's scenarios. The Coalition's policy achieves around 200 million tonnes of emission reductions domestically. This compares to around 290 million tonnes under the current legislation.
- + **To achieve the domestic emissions reductions that would deliver the 5 per cent target the Coalition's policy requires additional taxpayer expenditure of \$4 billion to 2020.** Weakening the Renewable Energy Target increases emission reduction costs by around \$250 million. If the Coalition relaxed its

ban on international emission reduction credits the cost of achieving the target would be substantially reduced to around \$190 million. If the restriction on international permits is not relaxed, achieving the 25 per cent emission target would require around \$15 billion in additional expenditure.

- + **Australia's carbon productivity falls behind global average improvements under Government and the Coalition scenarios.** Under the Coalition's policies, economic output per unit of carbon emissions is increased by around 6.4 per cent in 2020. This is about a third less than the improvement driven by the carbon laws, which achieve a 10.4 per cent increase. Based on separate Treasury assessments, global average improvements in a world seeking to avoid a 2°C increase in global temperature are projected to be 40 per cent. Both Government and Coalition policies also improve Australia's energy productivity but not to levels implied by the targets of other major economies including those of the US, EU and China.

**Executive Summary - Figure 1.** Modelled change in national emissions from 2000 levels in 2020 and 2030. Results are shown for all scenarios (including a case where just the carbon price is removed).



- + **In 2020, even with the Renewable Energy Target (RET) unchanged, the Coalition's policy to remove the carbon price reduces renewable energy generation to 22 per cent by 2020.** This compares to 24 per cent under the current legislation. Because the carbon price increases the wholesale price of electricity, it reduces the price of renewable energy certificates (generated under the legislated target to make investments viable). If the carbon price is removed, the price of renewable energy certificates increases above the levels of the RET's shortfall penalty charge. As a result firms pay the penalty rather than invest.

Reducing the RET, whether explicitly by changing the target or implicitly through removing the carbon price, produces little material economic benefit and may be offset by greater costs for emissions reduction and wholesale electricity costs.

Overall, the Coalition's climate change policy, as it is currently outlined or can be reasonably foreseen, is unlikely to enable Australia to help work with others towards our national climate interest of avoiding a 2°C increase in global temperature. The Government's policy also falls short but by a lesser margin.

If other countries followed the same route as the modelled policies, The Climate Institute's estimates indicate that the world would be on track to warming of 4.5–6.5°C by 2100 under the Coalition and 2.0–4.5°C by 2100 under current legislation.

Based on qualitative and quantitative analysis, The Climate Institute has concluded the core challenges confronting the Coalition are that the current proposed policy framework:

- + **Increases emissions and lacks scalability.** Beyond the practicality of implementing the proposed policy framework, the core issue remains that the Coalition's policy constrains budget expenditure but does not constrain emissions. In line with all independent analyses to date, we find that even under a variety of scenarios the money available is

insufficient to reduce Australia's emissions in line with the bipartisan target range, let alone drive greater emission reductions over the longer term.

- + **Does not make emitters responsible for their pollution, effectively subsidising high carbon activities.** The Coalition's policy currently does not include a broad-based price on carbon emissions. Instead the yet-to-be-determined carbon penalty is applied only to emissions above yet-to-be-determined 'business as usual' baselines. This implicitly subsidises current emitting activities and does not create a broad-based incentive for firms and individuals to invest in low emission technologies and behaviours. Using a similar approach to that used by the International Monetary Fund, which factors in a conservative estimate of the climate damage of every tonne emitted, The Climate Institute calculates that this subsidy equates to around \$50 billion to 2020. This allows emission intensive activities to out-compete cleaner technologies for a longer period of time.
- + **Risks undermining Australia's recent positive climate diplomacy, undermining global action.** The credibility and ambition of Australia's domestic policy settings will become more important under the new 2015 agreement currently being negotiated. That credibility comes into sharp relief in 2014 as international processes – including a world leader gathering – will focus on building the pre-2020 emission reduction ambitions of all major emitters. A policy that can meet stated international targets is central to strengthening the emerging architecture, building global ambition, and avoiding negative responses from other major economies. Policies that cannot demonstrably meet such goals risk institutionalising a return to an obstructionist or unhelpful climate diplomacy. Regardless, international scrutiny and trends would continue to put pressure on a Coalition government to implement emission trading or other more credible decarbonisation signals in 2015 or soon after.

Based on these findings The Climate Institute recommends that the Coalition take the following steps:

- + **Maintain the current legislative framework at least until the completion of detailed policy development and further independent analysis of the potential of the Coalition's policy to achieve up to a 25 per cent reduction in emissions on 2000 levels by 2020.** This should also include examination of the policy in the context of Australia's fair share of a long term global carbon budget consistent with helping to meet the national climate interest of avoiding a 2°C increase in global temperature.
  - + **Subject the Emission Reduction Fund and associated climate policies to rigorous Regulation Impact Statements as outlined in the Coalition's Policy to Boost Productivity and Reduce Regulation.** This should include consideration of the social cost of carbon and post-tax subsidies to emitting behaviours.
  - + **Include within the White Paper process a detailed assessment by Treasury of the emission reductions resulting from any proposed policy frameworks.** This should include consideration of expanding the ERF to
- include the purchase of credible international emission units to ensure Australia's international obligations are achieved.
  - + **Adopt the legislated review process with the independent Climate Change Authority recommending Australia's carbon emission caps, budgets and targets.** This review aligns with international processes in 2014 to increase emission reductions ambitions before 2020 and should be a key input into both the Emission reduction Fund White Paper process and Australian submissions on pre-2020 ambition under the Kyoto Protocol.
  - + **Commit to remove the legislated 2014 review of the Renewable Energy Target and focus the 2016 review on post-2020 policy settings.** Uncertainty in both carbon and renewable energy policy is hampering investment in low carbon solutions. The Coalition has recently re-committed to the legislated large-scale renewable energy target of 41,000 GWh of electricity generation by 2020. However, the Coalition intends to review the scheme and target in 2014, rather than leaving the next review to 2016 as recommended by the Climate Change Authority to promote investment certainty.

Should the Coalition be successful in removing the carbon laws this analysis implies much more would have to be done to get to 5 to 25 per cent emission reduction goals. Additional regulations and actions that would need to be considered to strengthen reductions towards their target range. These potentially include:

- + **Set declining emission baselines and carbon penalties for covered firms consistent with driving sustained decarbonisation of major emitting sectors.**
- + **Establish targets to ensure around 50 per cent of generation is renewable (or clean) energy by 2030.** This should be done by legislating a fixed gigawatt-hour target for the large-scale Renewable Energy Target.
- + **Require an increasingly stringent emission performance standard for existing power generation.** This should be set to ensure that the most emission intensive power generation is decommissioned by 2020 and the power sector is nearing net decarbonisation by 2030.

This would require non-peaking coal and gas plants to have full carbon capture and storage from this time.

- + **Implement a more consistent and ambitious policy framework to boost energy productivity by 30 per cent on 2010 levels by 2020.** Policies to achieve this change could include expanding state-based energy saving schemes into a nationally consistent and robust Energy Saving Initiative, implementing ambitious emissions or efficiency standards for vehicles, using the new national framework for regulating Minimum Energy Performance Standards (MEPS) to drive more ambitious equipment standards and ensuring energy pricing more accurately reflects the true costs of energy use. These energy efficiency measures, in particular, should also be adopted by the Government in the absence of a carbon price that reflects the benefits long-term action on climate change.

# Introduction

Every Federal election The Climate Institute (TCI) undertakes a thorough qualitative and quantitative assessment of the climate policies of various political parties and independent MPs. We judge each policy against our assessment of what is required for Australia to contribute to effective global climate change solutions, and build a prosperous and resilient Australia. The full qualitative assessment of the political parties and independents is available online.<sup>1</sup> The benchmarks for the 2013 election (detailed in TCI's *Managing the Unavoidable while Avoiding the Unmanageable* Policy Brief<sup>2</sup>) focus on:

- + **Cutting carbon pollution.** Does the policy have the ability to cut carbon emissions by 25 per cent (from 2000 levels) by 2020 and around 60 per cent by 2030? Ratification of Kyoto's second commitment period and making a fair contribution to international climate finance for vulnerable developing countries are also key criteria. Note that both major parties have committed to a 5–25 per cent target range and share the international goal of avoiding 2°C warming.
- + **Accelerating low carbon investments.** Does the policy establish a carbon price or penalty that makes businesses take responsibility for their emissions and drives structural change in high-emitting sectors? Other key criteria include policy stability for renewable energy investment, a 30 per cent boost in energy productivity, and greater corporate and investor transparency of emissions profiles.

- + **Preparing for climate impacts.** Does the policy include an integrated assessment of the climate risks under 2°C and 4°C warming scenarios for critical infrastructure and Government agencies? Does it lead to appropriate changes in national policies, standards, targets, and oversight? (While 190 countries have agreed to avoid 2°C current commitments would deliver 4°C of warming.)

This policy brief outlines the results of a quantitative emissions and economic analysis of both the legislated policies of the current Government and a range of approaches the Coalition could take to implement its policy platform. This analysis is based in large part on detailed modelling undertaken by SKM MMA and Monash University's Centre of Policy Studies (CoPS).<sup>3</sup>

The Climate Institute has also published a separate overview and analysis of the current Government's policy settings in partnership with the World Resources Institute and the international Open Climate Network.<sup>4</sup>

That report found that the current policy settings allow Australia to meet its agreed emission goals of up to a 25 per cent reduction in emissions from 2000 levels by 2020. The report also highlighted that the degree to which this relies on the purchase of international permits as opposed to emissions reduction within Australia depends on a range of factors. These include the influence of European carbon permit prices on Australia's carbon price, the maintenance of the large-scale Renewable Energy Target, the winding back of state-based land-clearing laws in Queensland and



---

the implementation of policies under investigation such as light vehicle emission standards and a national energy saving initiative.

This assessment also found that Australia is exposed to volatility in international carbon prices, which may slow the transition needed to achieve longer-term emission reductions. Direct policy interventions to reduce domestic emissions and boost energy efficiency (for example, stronger vehicle emission standards, regulatory approaches to limit fugitive emission increases, energy efficiency obligations on large energy users) would reduce these risks.

Given the focus of the Open Climate Network document, and the many questions currently outstanding around the Coalition's climate

change policy, this brief concentrates primarily on the strengths and weaknesses of the Coalition's proposed policy framework.

The first section of the brief provides a qualitative discussion of the Coalition's policy. The second outlines the approach taken in the modelling by SKM MMA and the CoPS. Section three presents the results of the modelling with a particular focus on the impact of the policies on reducing emissions and boosting low-carbon investments. The brief concludes with reflections on the proposed policy frameworks in light of the bipartisan supported national climate interest goal of avoiding a 2°C increase in global temperature.

# Climate Policy

## The Coalition's Position

*In the Coalition, we believe now, as we did back in 2007, that climate change is real, that humanity does make a contribution, and that you need a strong and effective policy to deal with it.*

**Tony Abbott**  
*Leader of the Opposition*  
*National Press Club*  
*31 January 2013*

Both the Government and the Coalition support two fundamental planks of Australia's climate policy framework: the international goal of avoiding a 2°C increase in mean global temperature and the domestic target of reducing emissions by up to 25 per cent below 2000 levels by 2020.

This bipartisan support reflects recognition by the scientific community that Australia is an advanced economy that is particularly vulnerable to the impacts of climate change. Avoiding 2°C warming is in our national climate interest.<sup>5</sup> For example, a report to Treasury by one of Australia's leading climate experts indicated that a 3-4°C increase in global temperature could result in the following impacts on Australia:<sup>6</sup>

- + **Natural ecosystems.** Extensive shift and deterioration of ecosystems across Australia, with risks to natural services. Total loss of alpine environments; major incursions of pests, weeds, and diseases.
- + **Water availability.** Dangerous water shortages and contamination events. Provision of water becomes a serious limiting factor in population growth, production of food, and protection of natural ecosystems.
- + **Coastal communities.** Coastal inundation, storm surges, and erosion requires abandonment of some coastal developments or the construction of major sea defences. Impacts are most significant in low-lying regions (e.g. Cairns, Gold Coast, etc.).
- + **Agriculture.** Substantially reduced production, despite CO<sub>2</sub> 'fertilisation' effect. Major management and wholesale changes to farming systems; erosion of the ecosystem services that underpin them. Coping capacity likely tested in several regions and industries.
- + **Human health.** Risks to human life and wellbeing from flooding, disease, fire, and storms. Coping capacity severely tested in some areas, with some public mental and physical health interventions essential and increasingly costly.
- + **Critical Infrastructure.** Infrastructure risks from interconnected impacts from extreme weather, human ill-health, depleted productivity. Requires enhanced emergency services; insurance rethought; radically different building standards.
- + **International pressures.** Enhanced international militarisation, tension, and conflict. Internal strife spills across borders. Water shortage for around half the world's people, health problems for hundreds of millions, and hundreds of millions more facing food shortages and coastal inundation. Humanitarian aid strained by tens of millions of displaced peoples in the region and regional security jeopardised.

There is currently, however, a stark difference between the major political parties as to how our national interest objectives are achieved. A summary of the Coalition's climate change policies is provided in Table 1.

There are many market-based approaches that could be used to achieve a given carbon emissions target. The effectiveness and cost of each approach will depend on its parameters, and how it manages inherent uncertainties, such as the extent of future emissions and the uptake of technological solutions.

Some key parameters have a particularly significant impact on the effectiveness and cost of any approach. These include the breadth of covered activities, limits on spending, the size and nature of penalties, eligibility criteria (e.g. the inclusion or exclusion of international units), and the ability to ensure that the desired quantity of abatement is delivered (i.e. managing the risk that specific projects may be delayed, go bust or underachieve their objectives).

The major structural differences between the current legislated policy package and the Coalition's approaches are:

- + **A budgetary not emissions constraint.** The amount of emissions reductions achieved through the Coalition's policy is effectively capped by the limit on expenditure from the Federal budget. The Coalition's policy does not place a legal limit on major emitters' contribution to global climate change. Although the Coalition has given in-principle support to an internationally binding limit on national emissions under the Kyoto Protocol, there is no enforcement mechanism in its national policy.

- + **Limited carbon price and subsidy to emitters.** The Coalition's policy will produce a shadow price on carbon but this direct price signal applies only to the proportion of emissions above a yet-to-be-determined business-as-usual baseline. As the International Monetary Fund recently noted, a failure to price all emissions effectively subsidises polluting behaviour.<sup>7</sup>
- + **Domestic not international emission reductions.** The Coalition has stated that it will achieve emission reductions up to the 5 per cent unconditional target through domestic emission reductions alone. Only if Australia's target is greater than 5 per cent would it consider the purchase international emission reductions. The Coalition has also committed to use the federal budget to fund emission reductions by stopping deforestation in some developing countries, but these do not count against agreed emission targets.<sup>8</sup>
- + **Uncertainty regarding the Renewable Energy Target's future.** The Coalition has recently re-committed to the legislated large-scale target of 41,000 GWh of electricity generation by 2020. However, the Coalition does not intend to remove the review of the target in 2014 as recommended by the Climate Change Authority to promote investment certainty.<sup>9</sup> This review, so soon after the Climate Change Authority's review completed in late 2012, has had the effect of stalling investment in renewable energy, potentially endangering achievement of the target and increasing the cost of energy sector investment in Australia.<sup>10</sup>

**Table 1. Summary of the Coalition's climate change policy<sup>11</sup>**

POLICY AREA	COALITION POLICY
<b>INTERNATIONAL COMMITMENTS</b>	<ul style="list-style-type: none"> <li>+ Supports agreed global goal of avoiding a 2°C increase in global temperature above pre-industrial levels.</li> <li>+ Unconditional 5% reduction on 2000 levels by 2020.</li> <li>+ Up to 15% reduction if there is a global agreement under which major developing economies commit to substantially restrain emissions and advanced economies take on commitments comparable to Australia's, but which falls short of stabilising emissions at 450 ppm. (Note 'agreement' does not mean legally binding instrument.)</li> <li>+ 25% reduction in the event of a global deal to stabilize CO<sub>2</sub>-e emissions at 450 ppm or lower.</li> <li>+ In-principle support for second commitment period of the Kyoto Protocol which translates unconditional target into a binding international agreement. (Under the Kyoto Protocol, this minimum commitment will be reviewed internationally in 2014.)</li> <li>+ International financing of projects to reduce emission from deforestation in developing countries.</li> </ul>
<b>DOMESTIC 2020 TARGETS</b>	<ul style="list-style-type: none"> <li>+ 5–25% reduction on 2000 levels by 2020 (as per international commitments).</li> <li>+ 5% target would be achieved entirely in Australia (no international permits).</li> <li>+ Repeal legislated domestic emission cap for sectors covered by emissions trading.</li> </ul>
<b>DOMESTIC LONG-TERM TARGETS</b>	<ul style="list-style-type: none"> <li>+ None (but will review post-2020 policy in 2015).</li> <li>+ Repeal legislated 80% reduction target.</li> <li>+ Supports agreed global goal of avoiding a 2°C increase in global temperature above pre-industrial levels.</li> </ul>
<b>PRINCIPAL EMISSIONS REDUCTION MEASURE</b>	<ul style="list-style-type: none"> <li>+ Emission Reduction Fund (ERF), a grant-tendering scheme: <ul style="list-style-type: none"> <li>- Cheapest emission reduction options will receive Government funding through a reverse auction process.</li> <li>- Funding will not be delivered until project implemented and abatement achieved.</li> <li>- Current Carbon Farming Initiative would be the platform to deliver the ERF.</li> <li>- Budget commitment of \$2.55 billion over the forward estimates. This initial commitment is capped. Original policy included \$10 billion in funding to 2020. The Coalition has indicated that funding after the forward estimates will be reviewed in 2015, as part of the broader review of the policy.</li> <li>- Post-2020 policy will be reviewed and determined in 2015.</li> </ul> </li> </ul>
<b>CARBON PRICE</b>	<ul style="list-style-type: none"> <li>+ Financial penalty for companies that exceed an emissions baseline based on business as usual: <ul style="list-style-type: none"> <li>- Baselines will be derived from historical National Greenhouse and Energy Reporting (NGER) Scheme data. New entrants will have baselines set by 'best practice'.</li> <li>- Full details of carbon penalty and baseline setting process to be determined in consultation with business in 2013/14.</li> </ul> </li> <li>+ Repeal of current legislated carbon pricing mechanism as soon as possible.</li> </ul>
<b>GOVERNANCE</b>	<ul style="list-style-type: none"> <li>+ Clean Energy Regulator to manage ERF and carbon penalty scheme.</li> <li>+ Repeal of legislation for independent statutory reviews by the Climate Change Authority of Australia's emission targets and domestic policy mechanisms.</li> </ul>
<b>RENEWABLE ENERGY</b>	<ul style="list-style-type: none"> <li>+ Supports retention of Renewable Energy Target (RET) and goal of 41,000 GWh large scale target in legislation.</li> <li>+ Will undertake legislated review of RET in 2014.</li> <li>+ Supports \$3 billion Australian Renewable Energy Agency.</li> <li>+ Repeal of \$10 billion Clean Energy Finance Corporation.</li> </ul>
<b>ENERGY EFFICIENCY</b>	<ul style="list-style-type: none"> <li>+ Supports current legislation for mandatory energy efficiency standards for appliances and equipment.</li> </ul>
<b>OTHER MITIGATION</b>	<ul style="list-style-type: none"> <li>+ Ancillary programs include funding for a <i>One Million Solar Roofs</i> program, <i>Solar Towns and Schools</i>, <i>Clean Energy Hub</i> for regional areas, a <i>Geothermal and Tidal Town</i>, and urban reforestation.</li> </ul>
<b>ADAPTATION</b>	<ul style="list-style-type: none"> <li>+ While risks of climate change scenarios are recognised, climate impacts are not included in key policies such as those for northern Australia or Infrastructure Australia.</li> </ul>

### Independent reviews of the Coalition's policy

To date a number of reviews of the Coalition's policy have identified several potential strengths and weaknesses:

- + **Ernst and Young (for the Australian Industry Group)**<sup>12</sup>. Grant-tendering schemes are unlikely to drive lowest cost abatement. Any additional costs required to meet a given target will ultimately be borne by taxpayers (including businesses) through increased taxation or diverted funds. While the policy may provide some short-term certainty, the policy creates significant uncertainty for business over the medium and long term. Uncertainty also extends to how the baseline and carbon penalty system will work, whether it will reduce emissions and the impact it will have on trade-exposed industries. Given its limited coverage, the policy is unlikely to drive broad-based innovation and research and development in low-carbon technologies.
- + **Department of Climate Change and Energy Efficiency**<sup>13</sup>. Analysis based on previous programs and published estimated emission reduction costs suggests that the emission reductions that could be achieved under the policy are subject to very large degrees of uncertainty, both in terms of scale and cost. The emission reductions 'claimed by the Opposition [are] very difficult to support on the basis of relevant experience'.
- + **Treasury**<sup>14</sup>. The economic costs of the Coalition's policy would be higher than Treasury's estimate of an emission trading scheme similar to the Governments because it forgoes the use of international markets and does not support broad-based emission reduction activities. The fiscal cost of the policy may be higher or lower than a broad-based carbon pricing mechanism depending on whether the projects funded actually reduce emissions and the ability of participants in the scheme to game the auction process.
- + **McLennan Magasanik Associates (MMA)**<sup>15</sup>. In 2009, The Climate Institute commissioned MMA to assess the strengths and weakness of baseline and credit schemes and cap and trade systems. The following points from this analysis apply specifically to the baseline and credit element of the Coalition's policy:
  - Administrative costs under a baseline and credit scheme are likely to be higher as these schemes are more complex to administer. Under a cap and trade system, a cap is set and emissions are monitored against this emission limit. Under a baseline and credit system, a baseline has to be set for each emitting activity, usually based on historical emission and production rates. This means that the administrator has to establish a baseline for each activity at each facility (generating plant, mine and industrial plant). This is complicated by the fact that emissions intensities differ widely even amongst plants in the same industry (for example, methane emissions from coalmines differ widely from mine to mine). The cost of setting and verifying baselines for each of these sites could be very high.
  - As the carbon price in baseline and credit schemes only applies to emissions above the baseline, it offers a weaker price signal than the carbon price applied to every tonne of emissions under an emission cap. This diminishes the incentive to produce and consume less emission intensive goods, or undertake less emission intensive activities.
  - Baseline and credit systems offer less certainty that the system's targets for emission reductions will be achieved. Unlike a cap and trade scheme, which accounts for absolute emissions, a baseline and credit system is based on emissions intensity. This means that in any one year there is no certainty that

a target will be met. Baselines may need to be continually reset to ensure targets are achieved; this creates policy uncertainty for market participants.

- The uncertainty surrounding the ability of a baseline and credit system to achieve its own targets increases the risk of failing to meet internationally agreed national targets. To meet the agreed national target may require additional purchases of large quantities of domestic reductions or international permits, imposing additional liabilities on taxpayers. Alternatively, a country unable to reach its target may renege on its international obligations, undermining global action.
- + **The Australia Institute (TAI)**<sup>16</sup>. Competitive grants could potentially play a part in a well-designed suite of policies to reduce emissions. However, given experience with similar programs it is 'excessively optimistic to place all of Australia's emissions reduction eggs in the competitive grant basket'. TAI suggests the ERF will cost far more than has been budgeted for and is unlikely to find sufficient greenhouse gas reduction projects to reach even the minimum 5 per cent target. If the average cost of abatement for competitive grant schemes conducted previously in Australia were to apply to grants provided through the ERF, the Fund would need to allocate around \$100 billion by 2020 to achieve Australia's minimum emissions target. TAI also notes that the Coalition's policy would require a very large number of public servants to administer effectively.

- + **Allens**<sup>17</sup>. In the absence of a broad-based carbon price there 'will be no deep pool of demand for emissions abatement that can provide a source of long-term revenue to underpin projects.' Investors face a high degree of uncertainty, as funding is dependent on the outcome of successful auctions, not locked in prior to project commencement, and reliant on annual budgetary appropriations. Funding predictability may be further reduced by additional economic and environmental selection criteria. The absence of any effective or enforceable cap on Australia's carbon emissions means there is no guarantee that emissions will be reduced. In the absence of a meaningful carbon price, the Renewable Energy Target will play a greater role in emission reductions.

#### **Domestic and international comparisons: the evidence from similar policies**

Domestic and international experiences generally support these conclusions. In particular, the mechanisms of the nature proposed by the Coalition have not achieved substantial absolute emissions reductions to date (Table 2). They do have a role but generally in supporting broader regulations and/or carbon pricing mechanisms.

Table 2 shows a range of domestic and international schemes similar to the Coalition's Emissions Reduction Fund. A number of these schemes are cited by the Coalition (e.g. Norway's Energy Fund and Fund for Climate, Renewable Energy and Energy Efficiency Measures and India's 'Perform-Achieve-Trade' energy efficiency obligation for industries), as similar measures. The table does not include the Clean Development Mechanism (CDM), which the Coalition sometimes cites as an example, because the CDM is part of a global cap-and-trade system defined by binding pollution limits.<sup>18</sup>

**Table 2.** Australian and international examples of emissions policies with similarities to the Coalition's approach. Baseline-and-credit schemes share similarities to the Coalition's proposed baseline-and-penalty approach. Grant-tendering schemes are similar to the ERF.

Scheme	Design Features	Comments
<b>Intensity or baseline and credit emission/energy saving schemes</b>		
<p><b>Alberta, Canada: Specified Gas Emitters Regulation (SGER)</b><sup>iii,iii,iv</sup></p> <p><i>Alberta accounts for one-third of Canada's emissions and has committed to:</i></p> <ul style="list-style-type: none"> <li>+ Reduce emissions by 20 million tonnes (Mt) below business-as-usual levels by 2010, and 50 Mt by 2020 (This represents an absolute increase in emissions on 2011 levels of ~7%).</li> <li>+ Reduce absolute emissions by 14% below 2005 levels by 2050</li> </ul> <p><i>Alberta's intensity-based model is under consideration as a model for a federal approach for certain sectors</i></p>	<p><b>Start date:</b> 2007</p> <p><b>Targets:</b> Reduce annual emissions <u>intensity</u> up to 12% below a baseline established using 2003–2005 averages for emissions and production. For facilities that entered commercial operation after 1999 there is no target for first three years of operation. A baseline is then set using averages from the third year of commercial production and the target is phased in until it reaches 12% in the ninth year of operation.</p> <p><b>Coverage:</b> Sets emissions <u>intensity</u> targets for facilities which emit more than 100,000 tonnes (t) of CO<sub>2</sub>-e. (Around 100 facilities covering approx. 50% of Alberta's total emissions are included.)</p> <p><b>Compliance:</b> To meet targets facilities can reduce emissions intensity (or use a banked credit from a previous years reduction); <u>pay a penalty of CA\$15/t into a technology fund</u>; purchase a domestic emission offset (including soil carbon); or purchase an emission credit from a covered facility that has reduce emissions below their target</p>	<p>In 2010, 42% of compliance was delivered through paying the penalty; 6% though facilities reducing emissions, 18% through purchasing credits from other facilities and 35% though domestic offsets</p> <p>Overall emissions continue to increase and Alberta is unlikely to achieve its 2020 targets without significant additional actions:</p> <ul style="list-style-type: none"> <li>+ Analysis of SGER suggests it is unlikely to deliver more than 5 Mt emission reductions below business as usual in 2020</li> <li>+ Alberta's emissions are projected to grow by 26–37 million tonnes between in 2007 to 2020</li> <li>+ Alberta's Auditor General has raised serious concerns around the validity of soil carbon and other emission offsets in the scheme. This strongly suggests emissions reductions achieved through SGER have been overestimated.</li> </ul>
<p><b>New South Wales, Australia: Greenhouse Gas Reduction Scheme (GGAS)</b><sup>v,vi,vii,viii</sup></p> <p><i>GGAS was one of the world's first mandatory carbon markets. It is a baseline and credit scheme and did not include absolute emission caps on electricity market participants.</i></p>	<p><b>Start date:</b> 2003 (closed 2012)</p> <p><b>Targets:</b> Annual electricity benchmark greenhouse target was set (7.27 tonnes of CO<sub>2</sub>-e per capita in 2012). Individual electricity retailers and certain other companies who buy or sell electricity in NSW were then set mandatory targets based on the size of their share of the electricity market.</p> <p><b>Coverage:</b> Forty-two participants in 2011 including 28 licensed electricity retailers, 1 electricity generator, and 25 large users of electricity.</p> <p><b>Compliance:</b> Compliance permits generally traded between \$5–\$15/t over the life of the scheme. Participants could also surrender offset credits from activities managing forests carbon. Penalty for non-compliance was \$17/t in 2012.</p>	<p>Federal Government projections estimate that GGAS reduced electricity sector emissions by 0.7 Mt in 2010.</p> <p>Researchers found that a significant proportion of the tradeable 'abatement' certificates were unlikely to correspond to the actual emissions reductions. The Department of Climate Change has arrived at similar conclusions.</p>

<sup>i</sup> EDF and IETA, 2013, *Alberta - The World's Carbon Markets: A Case Study Guide to Emissions Trading*, Environment Defence Fund/International Emissions Trading Association, Washington, D.C.

<sup>ii</sup> Matthew Bramley, Marc Huot, Simon Dyer and Matt Horne, 2011, *Responsible Action? An assessment of Alberta's greenhouse gas policies*, The Pembina Institute, Alberta.

<sup>iii</sup> P.J. Partington, Matt Horne and Clare Demerse, 2013, *Getting on Track for 2020*, The Pembina Institute, Alberta.

<sup>iv</sup> Auditor General of Alberta, 2011, *Report of the Auditor General of Alberta—November 2011*, Edmonton.

<sup>v</sup> Government of New South Wales, *Greenhouse Gas Abatement Scheme*. <http://www.greenhousegas.nsw.gov.au/>

<sup>vi</sup> Department of Climate Change and Energy Efficiency, 2010, *Stationary energy emissions projections*, Commonwealth of Australia, Canberra.

<sup>vii</sup> Robert Passey, Iain MacGill and Hugh Outhred, 2008, 'The governance challenge for implementing effective market-based climate policies: A case study of The New South Wales Greenhouse Gas Reduction Scheme', *Energy Policy* 36: 2999– 3008.

<sup>viii</sup> Department of Climate Change, 2010, *Analysis of Coalition Climate Change Policy Proposal*, Commonwealth of Australia, Canberra.

**Table 2 continued.**

<p><b>Perform-Achieve-Trade, India</b> <sup>ix, x</sup></p> <p><i>India's industrial and electricity sectors are responsible for around 60 per cent of the country's emissions.</i></p> <p><i>The PAT scheme is intended to contribute to India's development objectives: strengthen energy security, reduce the energy deficit, enhance the global competitiveness of Indian industries, and reduce the sectors' emissions intensity.</i></p> <p><i>Energy use and emissions are reduced relative to business as usual growth projections rather than absolute reductions and this is reflected in the national emission reduction commitment.</i></p>	<p><b>Start date:</b> 2012, after a four-year development process. Energy saving credits (for above-target achievement) issued in 2013, and credit trading to begin in 2014.</p> <p><b>Coverage:</b> Facility-specific targets for 478 organisations across 8 sectors: power, iron and steel, cement, fertiliser, aluminium, pulp and paper, chlor-alkali and textiles.</p> <p>The average target is a 4.8% reduction in energy consumed per unit of production. Total energy to be saved equates to 6.6 Mt of oil equivalent and 26 million tonnes of carbon dioxide equivalent (CO<sub>2</sub>e) over the program's first cycle (2012-2015).</p> <p><b>Compliance:</b> Each facility is assigned a specific energy consumption (SEC) reduction target compared to a baseline. The SEC is expressed in tonnes of oil equivalent per tonne of product. The baseline SEC is set as the average for the period April 2007–March 2010. Companies receive tradeable certified energy savings credits for efficiency gains beyond their targets, and can buy credits to make up any shortfall. Credits will be issued after the first year of the scheme, with the trading price set by the market.</p> <p>During the design phase, companies' 2005–10 production and energy consumption data were audited. Baseline energy audits were undertaken in 2011. Annual audits and verification by designated auditors. Penalties will be the price of energy credits needed to make up any shortfall.</p>	<p>Scheme is still in early stages of establishment and no results are yet publicly available.</p>
<p><b>Top 1000 Energy-Consuming Enterprises Program, China</b> <sup>xi,xii, xiii</sup></p> <p><i>Industrial energy conservation program targeting energy-intensive sectors. Expanded to 'Top 10,000 Enterprises' in 2011</i></p> <p><i>The program complements China's other initiatives such the shutting down of inefficient coal fired power stations, renewable energy laws, differentiated power prices for energy intensive industries and emerging emissions trading schemes.</i></p>	<p><b>Start date:</b> 2006</p> <p><b>Targets:</b> Energy savings of 100 million tonnes of coal equivalent (tce) from 2006 to 2010.</p> <p>Participating enterprises were each set a target expressed as total energy savings in 2010 against a growth baseline. Companies' targets were set taking into account their industrial sector, the energy saving target for the province or municipality in which they were located, and the 'general technology level of the enterprise'.</p> <p><b>Coverage:</b> Companies in the following sectors that consumed at least 180,000 tonnes coal equivalent (5.3 PJ): iron and steel, petroleum and petrochemicals, chemicals, electric power generation, non-ferrous metals, coal mining, construction materials, textiles, and pulp and paper.</p> <p><b>Compliance:</b> Mandatory. Rewards and penalties, as well as supporting programs technical assistance and information dissemination, were provided to companies and to the relevant provincial governments. Government officials were evaluated annually on the achievement of the targets within their jurisdictions.</p>	<p>Reported savings of 150 million tonnes of coal equivalent (tce) – 50 per cent over the target. Total emission reductions from 2006- 2010 of almost 400 million tonnes.</p> <p>However, the program was implemented very quickly, without time for detailed analysis of company baselines and targets. There is also a shortage of publicly available data to test the reported results at the enterprise, sector, provincial or national level. Some proportion of these savings may well have been made in the absence of the program.</p> <p>Supporting programs (such as energy audit assistance) were slower to implement. Lack of standards and guidance for energy audits and lack of expertise within companies meant that audit quality was highly variable.</p>

<sup>ix</sup> Neelam Singh, 2013, *Creating market support for energy efficiency: India's Perform, Achieve and Trade scheme*,. Climate and Development Knowledge Network, London.

<sup>x</sup> Rajesh Kumar, Arun Agarwala., 2013, '. "Renewable Energy Certificate and Perform, Achieve, Trade mechanisms to enhance the energy security for India', India", *Energy Policy*, 55: 669-676. <http://dx.doi.org/10.1016/j.enpol.2012.12.072>.

<sup>xi</sup> *Second National Communication on Climate Change of The People's Republic of China*, <http://inc.ccchina.gov.cn/WebSite/NationalCCC/UpFile/File116.pdf>

<sup>xii</sup> Mark D. Levine et al. 2010. *Assessment of China's Energy-Saving and Emission-Reduction Accomplishments and Opportunities During the 11th Five Year Plan*. Lawrence Berkeley National Laboratory and Azure International, Berkeley and Beijing. [http://chinausealliance.org/wp-content/uploads/2012/02/LBNL\\_Assessment-of-China%E2%80%99s-Energy-Saving-and-Emission-Reduction-Accomplishments-and-Opportunities-During-the-11-th-Five-Year-Plan.pdf](http://chinausealliance.org/wp-content/uploads/2012/02/LBNL_Assessment-of-China%E2%80%99s-Energy-Saving-and-Emission-Reduction-Accomplishments-and-Opportunities-During-the-11-th-Five-Year-Plan.pdf)

<sup>xiii</sup> Industrial Energy Efficiency Policy Database, 'CN-3a:Top-1000 Energy-Consuming Enterprises Program' [webpage] <http://www.iepd.iipnetwork.org/policy/top-1000-energy-consuming-enterprises-program>



**Table 2 continued.**

Abatement purchase schemes (grant tendering)		
<p><b>Greenhouse Gas Abatement Program (GGAP)</b><sup>xiv, xv, xvi, xvii</sup></p> <p><i>GGAP was a government fund which aimed to purchase emission reductions with a view help Australia's achieve its first Kyoto target.</i></p>	<p><b>Start date:</b> 2000 (ended 2009).</p> <p><b>Budget:</b> \$400 million over four years.</p> <p><b>Coverage:</b> Emission reduction projects from projects including co-generation, energy efficiency, travel demand management, alternative fuels, and coal mine gas technologies.</p> <p><b>Compliance:</b> Strong additionality conditions were implemented to ensure that Government funds went to projects that would not have otherwise occurred.</p>	<p>Reviews of the policy by groups such as the Australian National Audit Office have found:</p> <ul style="list-style-type: none"> <li>+ Emission reductions were 'substantially less' than projected – 15.5 Mt of the planned 51.5 Mt.</li> <li>+ Many of the projects approved by the Minister did not proceed – 9 of the 23 approved projects (valued at \$44 million) were terminated due to failures to meet contractual obligations and operational difficulties.</li> <li>+ Only 40% of its original budget allocation was spent –\$121.1 million of \$400 million. Low uptake was in part driven by conditions of real emission reductions which:               <ul style="list-style-type: none"> <li>- increased administration and compliance costs.</li> <li>- meant businesses had to factor in the risk that they proceed through the process and but do not receive funds.</li> </ul> </li> </ul>
<p><b>Clean Technology Program, Australia</b><sup>xviii</sup></p> <p><i>Established by the Commonwealth Government as part of the Clean Energy Future package to help manufacturers invest in energy efficiency, this comprises three sub-programs:</i></p> <p><i>Clean Technology</i></p> <ul style="list-style-type: none"> <li>+ <i>Investment Program (CTIP)</i></li> <li>+ <i>Food and (CTFFP) Foundries Investment Program</i></li> <li>+ <i>Innovation Program</i></li> </ul>	<p><b>Start date:</b> 2012 (forecast to close by 2019)</p> <p><b>Budget:</b> \$1 billion (approx.) in grants of up to 50% of project costs</p> <p><b>Source of funds:</b> indicatively, carbon price revenue</p> <p><b>Objective:</b> CTIP and CTFFIP aim to help manufacturers invest in energy efficiency capital equipment and low pollution technologies, processes and products.</p> <p><b>Grant criteria:</b></p> <ul style="list-style-type: none"> <li>+ CTIP – extent of reduction in emissions intensity, extent of enhanced competitiveness; (large grants) contribution to manufacturing industry, and broader economic benefits</li> <li>+ Innovation Program – extent of emissions or energy consumption reduction; commercial potential; technical strength; applicant capability.</li> </ul> <p><b>Targets:</b> None specified.</p>	<p>Grants to date total \$290 million, expected to leverage a further \$850 million in private investment.</p> <p><i>CTIP and CTFFIP</i> As of 21 April \$557 million in total grants and co-funding, expected to result in abatement of 11.37 Mt CO<sub>2</sub>-e in total.</p> <p>Cost per tonne of emissions reduced (as of April 2013)</p> <ul style="list-style-type: none"> <li>- Grant funds \$15.80/tonne</li> <li>- Total funds \$49/tonne</li> </ul> <p>There is no additionality requirement in the CTP, so many of these projects may have been implemented to some degree anyway.</p> <p>The Clean Technology Programs help reduce emissions in sectors also covered by carbon price, so both policies are at play to drive emissions reductions.</p>

<sup>xiv</sup> Department of Climate Change, *Coalition Climate Change Policy Proposal*.

<sup>xv</sup> Department of Finance and Deregulation, 2008, *Strategic Review of Australian Government Climate Change Programs*, Commonwealth of Australia, Canberra.

<sup>xvi</sup> Australian National Audit Office, 2010, *Audit Report No.26 2009–10, Performance Audit, Administration of Climate Change Programs*, Commonwealth of Australia, Canberra.

<sup>xvii</sup> John Daley and Tristan Edis, 2011, *Learning the hard way: Australian policies to reduce carbon emissions*, Grattan Institute, Melbourne.

<sup>xviii</sup> AusIndustry, 2013. 'Clean Technology Programs' [webpage],

<http://www.ausindustry.gov.au/programs/CleanTechnology/Pages/default.aspx>, accessed 8 August 2013.

*Table 2 continued.*

<p><b>Abatement and technology funds, Norway</b> <small>xix, xx, xxi</small></p> <p><i>Norway has several funds targeted at reducing emissions and facilitating low carbon investments. They are administered by Enova, a public body under the Ministry of Petroleum and Energy.</i></p> <p><i>Norway has a national 2020 emission target to reduce emissions by 30-40% below 1990 levels.</i></p> <p><i>Norway has also introduced a carbon tax of between NOK190-410/t (\$A35-\$75/t) and is part of the EU's emission trading scheme.</i></p>	<p><b>Energy Fund</b></p> <p><b>Start date.</b> 2001</p> <p><b>Sources of funds.</b> Charge on electricity transmission; interest income on capital and returns from the Green Fund for Climate, Renewable Energy and Energy Efficiency Measures (below).</p> <p><b>Budget.</b> around 2 billion NOK (A\$370 million)/year</p> <p><b>Objective:</b> 'Promote environmentally friendly restructuring of energy end-use and energy production, as well as development of energy and climate technology.' Specific goals:</p> <ul style="list-style-type: none"> <li>- Development and deployment of new energy and climate technologies (at least 10% of funds).</li> <li>- Increase efficiency, flexibility and diversity of energy supply and use.</li> </ul> <p><b>Targets.</b> For 2012–2015, funded projects must achieve 6.25 TWh. (This includes renewable energy and energy savings.)</p> <p><b>Coverage.</b> Immature energy technologies, buildings, and industry.</p> <p><b>Compliance.</b> Enova estimates energy impact before grants; project proponent documents energy impact once project is operational; three years after operations commence, Enova reviews.</p>	<p>Enova assesses projects both by their cost per kWh achieved over the project lifetime, but also according to their alignment with the Energy Fund's objectives.</p> <p>Funding must also enable ("trigger") projects that would not be implemented otherwise.</p> <p>Over 2001–2011, the Energy Fund spent 10.7 billion NOK (A\$1.9 billion), for the following results within that timeframe:</p> <ul style="list-style-type: none"> <li>- Energy impact: 435,000 tonnes oil equivalent</li> <li>- Direct emissions reduction: 1.5 Mt CO<sub>2</sub></li> <li>- Direct plus indirect emissions reduction: 2.7–9.6 Mt CO<sub>2</sub></li> </ul> <p>By comparison, Norway's carbon tax on offshore petroleum is estimated to have cut emissions by 5 Mt CO<sub>2</sub> in 2010 alone.</p>
	<p><b>Green Fund for Climate, Renewable Energy and Energy Efficiency Measures</b> (replacing and expanding on the mandate of the "Basic Fund")</p> <p><b>Start date.</b> 2012</p> <p><b>Source of funds.</b> Government revenue</p> <p><b>Budget.</b> 35 billion NOK (A\$6.4 billion) increasing to 50 billion NOK (A\$9.1 billion) by end of 2016.</p> <p><b>Operations.</b> Interest earned from Green Fund is used by Energy Fund. Energy Fund expected to receive 220 million NOK (A\$40 million) from Green Fund in 2014.</p> <p><b>Targets.</b> Two-thirds of Green Fund allocation must be spent on domestic projects.</p>	

<sup>xix</sup> Enova, 2012, *Annual Report 2012*, Enova, Trondheim.

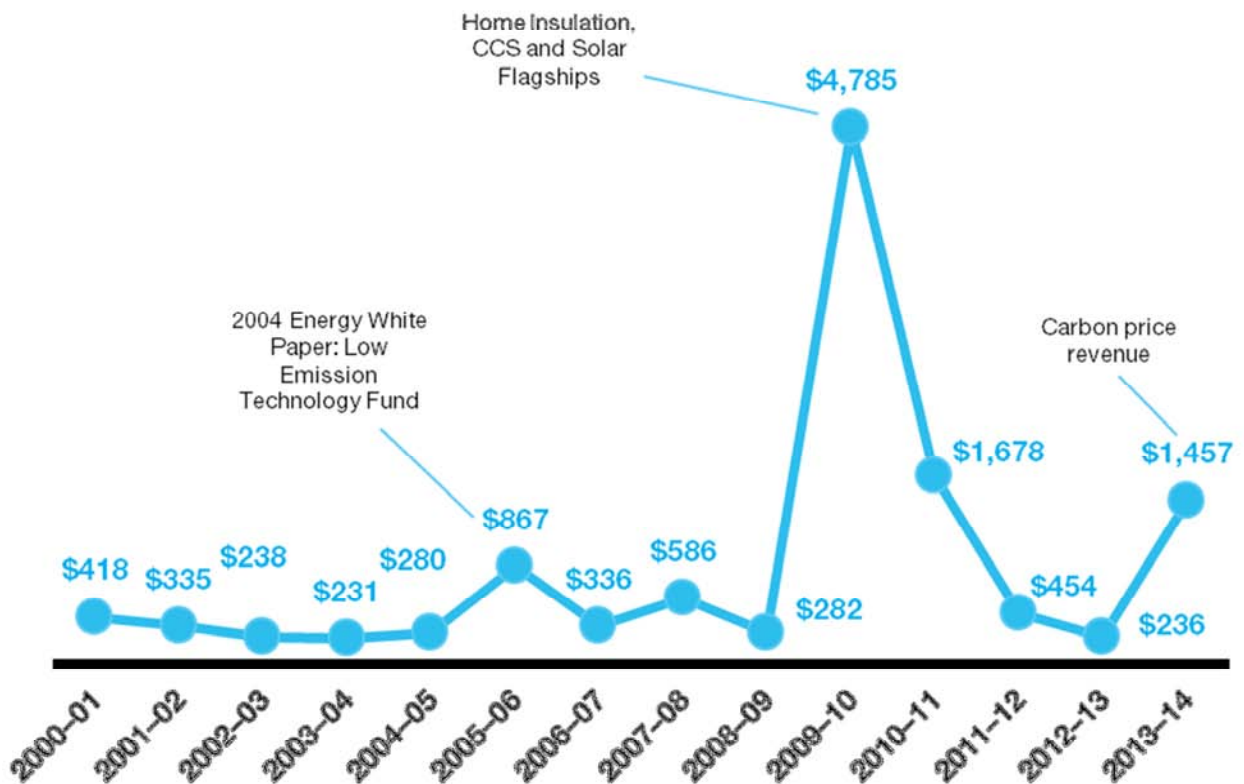
<sup>xx</sup> Government of Norway, 2009, *Norway's Fifth National Communication under the Framework Convention on Climate Change: Status report as of December 2009*, Norwegian Ministry for the Environment, Oslo.

<sup>xxi</sup> Bellona Foundation, personal communication, 23 July 2013.

The Coalition has also likened its policy to the water market in the Murray-Darling Basin. The Coalition argues that Commonwealth purchase of water-use entitlements from willing sellers in an effort to meet environmental objectives sets a precedent for its ERF policy. The government-as-buyer element of Australia's water policy is, however, only a part of a larger system of established, limited and tradable water entitlements; every megalitre used has a market value. A cap is set to ensure overall water extraction moves towards more sustainable levels. Trade in water entitlements helps to reduce the costs of the cap by allowing scarce resources to find their highest value industrial use. In other words, Australia's water market more closely resembles the legislated carbon market than the Coalition's policy.

**Figure 1. Federal Budget climate and clean energy commitments: 2000/01 to 2013/14 (\$millions, adjusted for inflation).<sup>19</sup>**

Source: The Climate Institute analysis of Federal Budget papers.



### Budget risks to climate policy objectives

Experience shows that federal budget commitments, whether to climate programs or any other policy, can vary widely year to year depending on the particular politics and budget pressures of the time (Fig. 1).

Such volatility and exposure to political whim is the reason why many in the energy industry have argued for the shift of technology support from the federal budget to more sustainable programs like the Renewable Energy Target in order to improve investor certainty.

There is no justification to assume that future budget commitments would be any safer from change. As with the Coalition's auxiliary mitigation measures (*Solar Towns and Schools*, etc) the ERF would be subject to a high degree of fiscal uncertainty. Although the Coalition has committed annual funds to the ERF in its forward estimates, it has also said it will review the policy and potentially revise it in 2015.

## Modelling the Coalition's emission policies

The Climate Institute engaged SKM MMA and the CoPS at Monash University to undertake the most extensive quantitative examination of the Coalition's proposed carbon reduction mechanisms to date.<sup>20</sup>

In this assessment, SKM MMA's National marginal abatement cost model was used to provide insights into, and assess the options likely to be funded under, both the Coalition's policy and the Government's legislated carbon-pricing mechanism.

The model assesses a range of emissions abatement opportunities in sectors covering energy, transport, agriculture, industrial processes, fugitive emissions, , and waste. Median estimates of the emission reductions from the land sector are used. The likely cost and potential emission abatement of all the options eligible under a specified policy is assessed and ranked from lowest to highest cost (in terms of \$/t CO<sub>2</sub>-e).

This assumes that the lowest cost combination of options in covered sectors will be selected under the fund up to any budget or emissions limit. Only options that are additional (i.e. would not have proceeded in absence of the fund) are considered. Relevant outputs under the emission reduction modelling and other relevant external assumptions have been input into the MMRF-Green model of the Australian economy to determine relevant macroeconomic outputs.

The Coalition is yet to announce details of key elements of their policy. To capture a range of possible policy options a number of scenarios were evaluated.

+ **Minimum carbon laws (Reference case).**  
The current legislated policy environment. There are two important points to consider here. Firstly, domestic emissions will be affected by the carbon price and other policies like the Renewable Energy Target. As Australia's carbon price is likely to be largely shaped by international markets, the modelling uses a simple carbon price pathway consistent with Government and market forecasts of global prices. Low or higher carbon prices would change the balance of emission reductions between domestic actions and the import of international units outlined below. For example, higher carbon prices would favour more domestic emission reductions.

Secondly, domestic emission reductions are not the total of Australia's contribution to avoiding climate change. To meet a given target Australia can also import credible emission reduction credits from international markets. In the modelling any gap between domestic emissions and the target is met with the import of international credits. This represents the practical situation whereby the Government sets an emission limit consistent with a stated national target and businesses, are able to decide, within defined limits, whether to reduce their emissions or buy an Australian or international credit to meet emission liabilities.

In the results presented below both domestic only and net (including imports of credits) emission reductions are shown, where appropriate. The modelling assumes that at a minimum Australia will meet its international obligations under the Kyoto Protocol. A range of emission outcomes is also shown in some cases. These represent possible outcomes from the process that is underway to set Australia's final emission target in 2014. Separate macroeconomic modelling indicates that under current policy settings stronger targets are very unlikely to have a material impact on Australia's economy as the carbon price is largely determined by global actions not Australia's target.<sup>21</sup>

- Note the modelling does not account for recent policy announcements to bring forward the emission trading scheme by one year. This will not, however, materially impact the results presented.
- + **Coalition (Base case).** Carbon price scheme, Clean Energy Finance Corporation and other revenue transfers such as assistance to trade exposed industries are repealed on 1 July 2014 and replaced by an Emission Reduction Fund with funding capped as announced. Baselines, penalties for emissions above baselines, and new entrant baselines assumptions to be set as outlined in Table 3.
  - + **Coalition (Lower RET).** As with base policy scenario but Large-scale Renewable Energy Target (LRET) is reduced to match a 'real 20 per cent' level by 2020 and a 25 per cent level by 2025. This scenario assesses the impact of weakening the Renewable Energy Target after the 2014 review.
  - + **Coalition (High RET).** As with base case but RET increased to 30 per cent by 2020 and 50 per cent by 2030. This scenario assesses the capacity of a stronger Renewable Energy Target to bridge any shortfall in emissions reductions from 2020 onwards.
  - + **Coalition (Absolute baselines).** As with base policy scenario but baselines are set in absolute terms. The scenario is a sensitivity analysis of the impact of changing company baselines from intensity (e.g. tonnes of emissions per unit of value add) to absolute (e.g. tonnes of emissions). This scenario also includes an effective ban on new traditional coal-fired generation to represent more stringent baselines for new entrants.
  - + **Coalition (Decline and trade).** As with base policy scenario but baselines decline in line with the national emissions reduction average required to meet the national emission target. Liable entities can purchase international and domestic units to avoid being penalised, or sell credits for emissions below their baselines to other liable parties.

**Table 3. Key assumptions in the modelling of the Coalition base policy.**

**FUNDING.** There is uncertainty around budget commitments to the ERF past the forward estimates. The modelling assumes past commitments are honoured and there is a cap on funding set at \$300 million in 2014/15, \$500 million in 2015/16 and \$750 million in 2016/17, \$1.0 billion in 2017/18 and \$1.2 billion in 2018/19 and in 2019/20. Budgets after this period has not been announced but is assumed that funding will increase by 5 per cent per annum thereafter.

ERF grants apply to actual abatement as it occurs and are set at pay-as-bid rates. Funding is spread over a typical operating life up to 10 years to ensure long-term performance. It is assumed that approval would take one year so that the program would be installed in the normal installation period plus one year.

**REVERSE AUCTION BIDS.** Bids won through the reverse auction process are assumed to cover the cost of abatement that could not be covered by normal commercial transactions (i.e. the net incremental cost of adopting the option) plus compliance costs.

**ADDITIONALITY.** The amount of emission reductions for each project will be determined as the net change in emissions compared to conventional versions of the technology. It is assumed that the intent will be to achieve additional abatement over and above what would have occurred under business as usual conditions.

**BASELINES.** NGRS data is used to derive baselines for each entity registered under the scheme. Baselines are set at the entity's historical average emissions intensity for the three years to and including 2010–11. Intensity baselines will be set using value add as the numerator. For new entrants and expansion of existing capacity, emission intensities will be set at the top Australian rate for each sector.

**CARBON PENALTY.** Growth and emission intensity projections from the MMRF–Green model are used to determine whether the carbon penalty is paid in regard to the historical baseline: projected emissions above the historical baseline for industry sector incur the penalty.

Modelling of the carbon penalty regime is a key element of the analysis. The penalty acts as a shadow carbon price in investment decisions to expand or for new entrants to enter. Firms have the choice either of paying the penalty when expanding or entering, or of investing in low-emissions technology. The choice will depend on what is the least cost. Firms can avoid paying the penalty (on emissions above baselines) if it is lower cost to invest in new technology.

The penalty for emitting above baselines is set at \$15/t in 2014/15 increasing to \$20/t in 2020, escalating by 6.5 per cent annum in nominal terms (and about 4.0 per cent in real terms) thereafter. The penalty of \$15/t is comparable to that that operated in the NSW Greenhouse Gas Reduction Scheme and currently operated in Alberta's Specified Gas Emitters Regulation (Table 2).

(Note: In most cases, as is the intent of the Coalition's policy, the penalty payments are not triggered. This is because of modelling assumptions that see industries naturally improve their energy efficiency through time. These improvements occur because due to technological developments each new generation of capital goods is likely to be more energy efficient than the one before.)

**LAND SECTOR REDUCTIONS.** The Carbon Farming Initiative is expanded to all sectors under the ERF. Baseline emissions based on Government emission projections with no carbon price induce estimates of new Kyoto Protocol accounting changes and an estimate of the impact of changes in regulations on land clearing in Queensland. SKM MMA allowed for the median estimate of the potential for soil carbon in Coalition policy cases. There is, however, considerable uncertainty around the actual emissions reductions that might be delivered by payments for soil carbon management. Many of the land management practices required to build up and maintain significant and sustainably higher levels of carbon in the soil are unlikely to prove financially attractive under Coalition policy. The modelling is likely to overstate emission reductions as a result.

**ADMINISTRATIVE AND COMPLIANCE COSTS.** Administrative cost of this process is assumed to be \$2/t and \$3/t abated in line with costs incurred under the Greenhouse Gas Abatement Program and NSW Energy Savings Scheme programs. These costs are set at a fixed rate to reflect economies of scale. For example, the administration cost would be high if the program includes soil carbon initiative because of the small size of grants. Emissions reduction options which see the aggregation of effort are also included. It is assumed there will be a rigorous process to determine that abatement will be additional, and this takes time to evaluate.

**ADDITIONAL EMISSION REDUCTIONS.** To the extent that proposed Coalition carbon policies do not achieve the target, there is the option of closing the deficit by sourcing international credits and/or purchasing more domestic emissions reductions. A post-modelling exercise was undertaken to calculate the cost of purchasing sufficient units to bridge any deficit between abatement achieved and both the 5 and 25 per cent emission reduction targets.

# Cutting Pollution, Boosting Investment Modelling Results

This section comprises The Climate Institute's analysis of the modelling results from SKM MMA and CoPs.<sup>22</sup> A summary of the results is provided in Table 4.

**Table 4.** Summary of SKM-MMA/CoPS modelling results

Under all scenarios the economy and employment continue to grow strongly. For example, Gross National Income per capita grows by around \$6,900 by 2020 under the current policy framework and by around \$7,200 under Coalition policies. The macroeconomic impacts of the carbon laws and the Coalition's policy are not directly comparable.

VARIABLE	Metric	LEGISLATED CARBON LAWS		COALITION				
		Net intl trade	Domestic only	Base	Lower RET	High RET	Absolute baselines	Declining baselines and trade
<b>NATIONAL EMISSIONS</b>								
<b>2020 EMISSIONS</b>	<i>% change on 2000</i>	-5%	5%	9%	10%	8%	9%	9%
<b>EMISSIONS GAP: 2013-2020</b>	<i>Mt CO<sub>2</sub>-e</i>	0	182.7	265.7	275.9	240.3	267.6	253.7
<b>DOMESTIC ABATEMENT TO 2020</b>	<i>Mt CO<sub>2</sub>-e</i>	287	287	204	194	229	202	203
<b>INTERNATIONAL ABATEMENT TO 2020</b>	<i>Mt CO<sub>2</sub>-e</i>	184	-	-	-	-	-	12
<b>TOTAL NATIONAL EMISSIONS TO 2050</b>	<i>Gt CO<sub>2</sub>-e</i>	15.3	24.3	27.7	27.6	26.1	27.1	26.5
<b>ADDITION GOVERNMENT EXPENDITURE TO MEET -5% 2020 TARGET</b>	<i>billions Real 2012\$</i>	-	-	\$ 4.07	\$ 4.32	\$ 4.12	\$ 4.08	\$ 3.46
<b>ADDITION GOVERNMENT EXPENDITURE TO MEET -25% 2020 TARGET</b>	<i>billions Real 2012\$</i>	-	-	\$ 14.91	\$ 15.16	\$ 14.96	\$ 14.92	\$ 14.30

Table 4 continued.

VARIABLE	Metric	LEGISLATED CARBON LAWS		COALITION				
		Net intl trade	Domestic only	Base	Lower RET	High RET	Absolute baselines	Declining baselines and trade
<b>MACRO ECONOMIC INDICATORS</b>								
<b>GNP/PERSON: CHANGE 2020</b>	Real 2012\$	\$ 6,884	-	\$ 7,183	\$ 7,183	\$ 7,178	\$ 7,183	\$ 7,183
<b>GNP/PERSON: CHANGE 2020</b>	% change	8.8%	-	9.2%	9.2%	9.2%	9.2%	9.2%
<b>EMPLOYMENT: CHANGE TO 2020</b>	million persons	1,201.7	-	1,229.5	1,229.5	1,244.6	1,194.5	1,238.6
<b>EMPLOYMENT: CHANGE TO 2050</b>	% change	10.7%	-	11.0%	11.0%	11.1%	10.6%	11.1%
<b>CARBON PRODUCTIVITY: CHANGE TO 2020</b>	% change in Real 2012 \$GDP/t natl emissions	-	10.4%	6.4%	5.2%	7.5%	6.2%	6.8%
<b>BOOSTING LOW CARBON INVESTMENT</b>								
<b>CARBON INTENSITY: CHANGE TO 2020</b>	% change in national emissions/Real 2012 \$GDP	-14%	-	-11%	-10%	-12%	-10%	-11%
<b>ENERGY PRODUCTIVITY: CHANGE TO 2020</b>	% change in Real 2012 \$GDP/final energy consumption (PJs)	5.5%	-	4.4%	4.4%	4.4%	4.4%	4.4%
<b>RENEWABLE ENERGY GENERATION: 2020</b>	% electricity generation (TWhs)	24%	-	22%	22%	24%	22%	22%



## Cutting Pollution

Under all Coalition scenarios Australia's emissions continue to increase to 2020 and beyond. Emissions increase by 9 per cent (8-10 per cent range) above 2000 levels by 2020 (*Fig. 2 and 3*). This creates the need for additional emission reductions of around 270 million tonnes to 2020 to achieve the minimum target (*Fig. 4*). Even with ongoing and increasing budgetary outlays in the order of \$88 billion dollars<sup>23</sup> to 2050, emissions continue to rise by around 45 per cent over this timeframe.

The Government's carbon laws drive substantially more emission reductions domestically than the Coalition's policy scenarios (*Fig. 5*). To 2020, the current carbon laws achieve around 470 million tonnes of emission reductions, of which around 290 million tonnes occur domestically. This is roughly 40 per cent stronger than the domestic emission reductions achieved under the Coalition's scenarios. (In the scenario where the Coalition substantially increases the Renewable Energy Target domestic emission reductions are comparable to current minimum carbon laws to 2030.)

To achieve the emissions reductions required to deliver the Coalition's commitment to the 5–25 per cent targets would require additional expenditure of \$4–\$15 billion to 2020.<sup>24</sup> Access to Kyoto's international markets could reduce this budgetary

cost to around \$190-\$710 million. Conversely, weakening the Renewable Energy Target increases these costs by around \$250 million.

Neither the Government or the Coalition currently has long term policies in line with the emissions reductions required for Australia to play its fair part in global efforts to avoid a 2°C increase in mean global temperature.<sup>25</sup> This conclusion could be changed if the Climate Change Authority recommends a credible long-term carbon budget for Australia, aligns the national emissions trajectory to this goal and the Government accepts these recommendations.<sup>26</sup>

Emissions to 2050 in the Coalition scenarios are around 14–22 billion tonnes more than more equitable contributions over the period (*Fig. 7*). The carbon laws result in emissions 3–9 billion tonnes above. Put another way, the average Australian would emit nearly three times the global average under 2°C climate scenarios under the Coalition's modelled policies. Under the carbon laws scenario it would be around one and half times more.

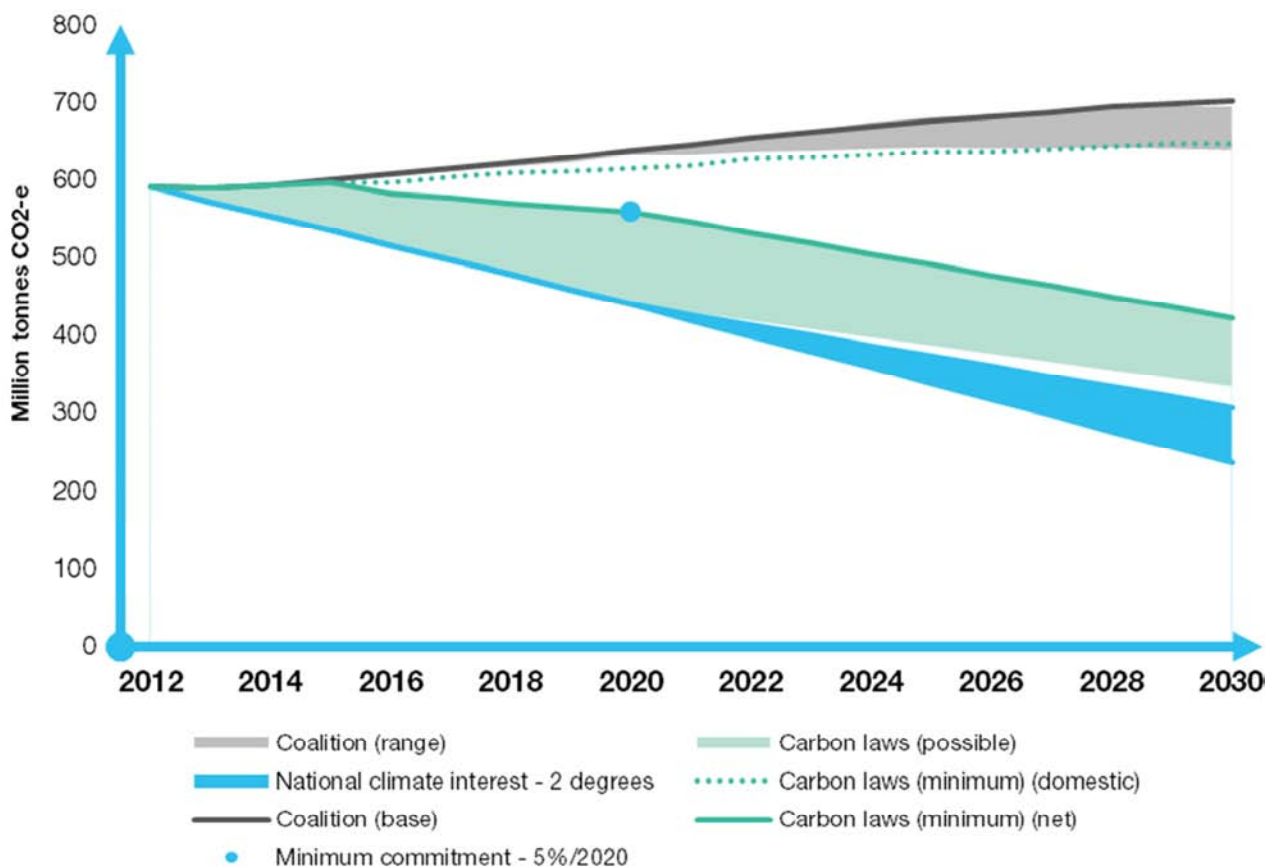
The Climate Institute estimates that if other countries followed the same route as the modelled policies implied then the world would be on track to warming of 4.5–6.5°C by 2100 under the Coalitions and 2.0–4.5°C by 2100 under the current legislation.<sup>27</sup>

**Figure 2. Total national carbon emissions (2012–2030).** National carbon emissions are shown for the period 2012–2030 for each of the scenarios assessed. Coalition scenarios are in grey. Both the base Coalition case and the range of outcomes from all the other Coalition scenarios are shown.

The impact of current carbon legislation is shown in several ways: net emissions (solid green line), domestic emissions reductions only (dotted green line), and possible emission reductions if the emissions cap is strengthened following the recommendations of the Climate Change Authority (green area).

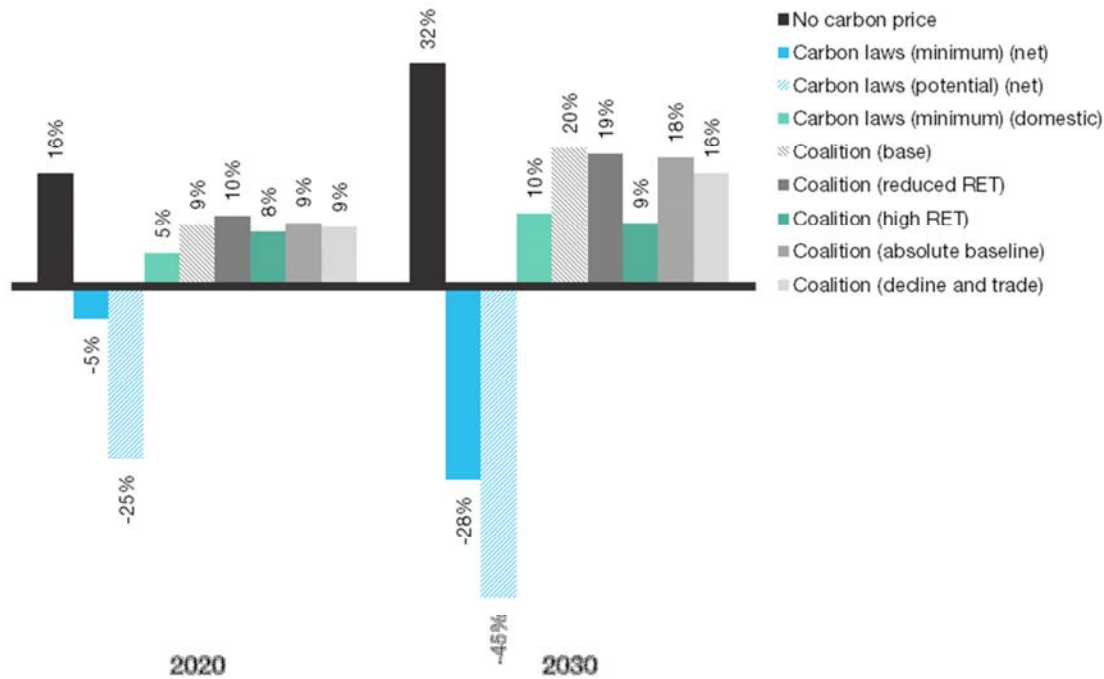
These are compared to emission reductions associated with Australia's national climate interest of avoiding a 2°C increase in global temperature ('National climate interest', blue area).

Source: The Climate Institute analysis based on SKM–MMA, 2013

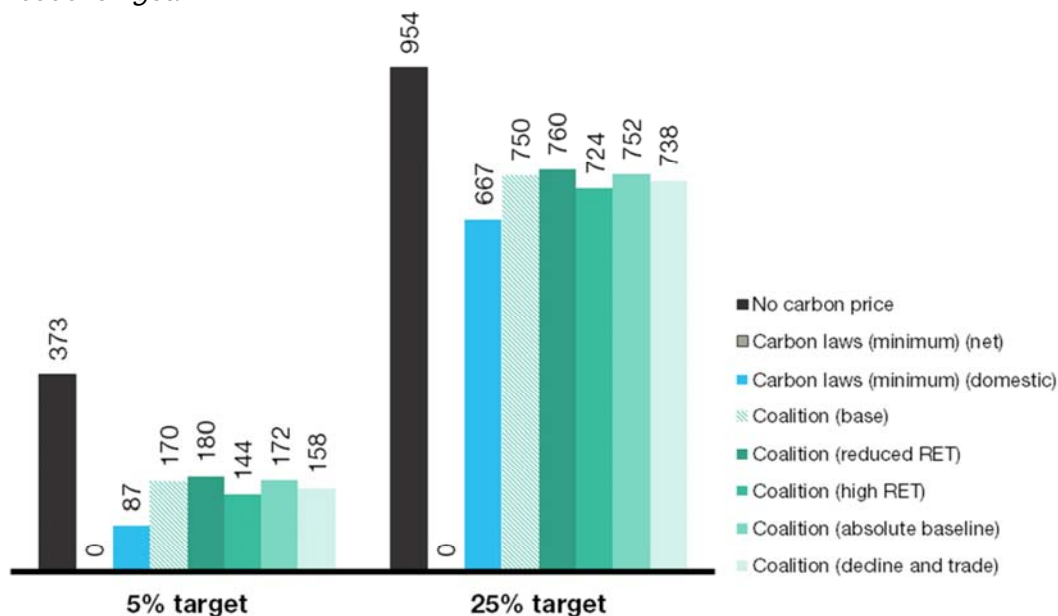


**Figure 3. Modelled change in national emissions from 2000 levels in 2020 and 2030.** Results are shown for all scenarios (including a case where just the carbon price is removed).

**Figure 3-7 Source:**  
The Climate Institute analysis based on SKM-MMA, 2013



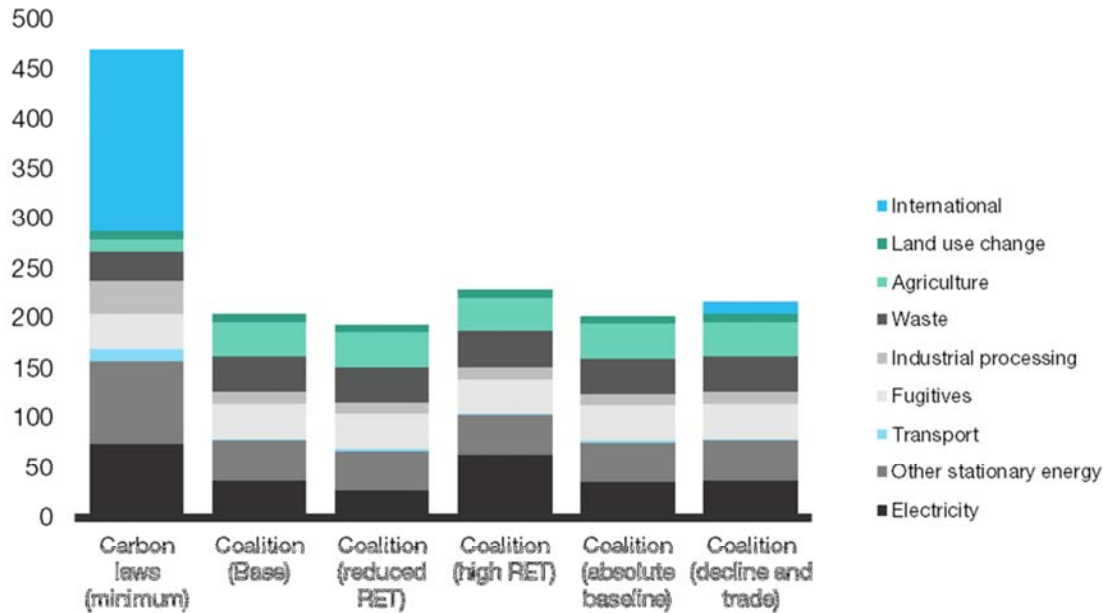
**Figure 4. Shortfall in emission reductions to achieve minimum 2013–2020 emission reductions (million tonnes of CO<sub>2</sub>e).** Australia's international commitments require us to limit emissions to a certain amount of pollution over the period from 2013 to 2020. This figure shows the additional cumulative emission reductions required to meet this goal and an equivalent target associated with our conditional 25 per cent reduction goal.



**Figure 5. Sources of emission reductions**

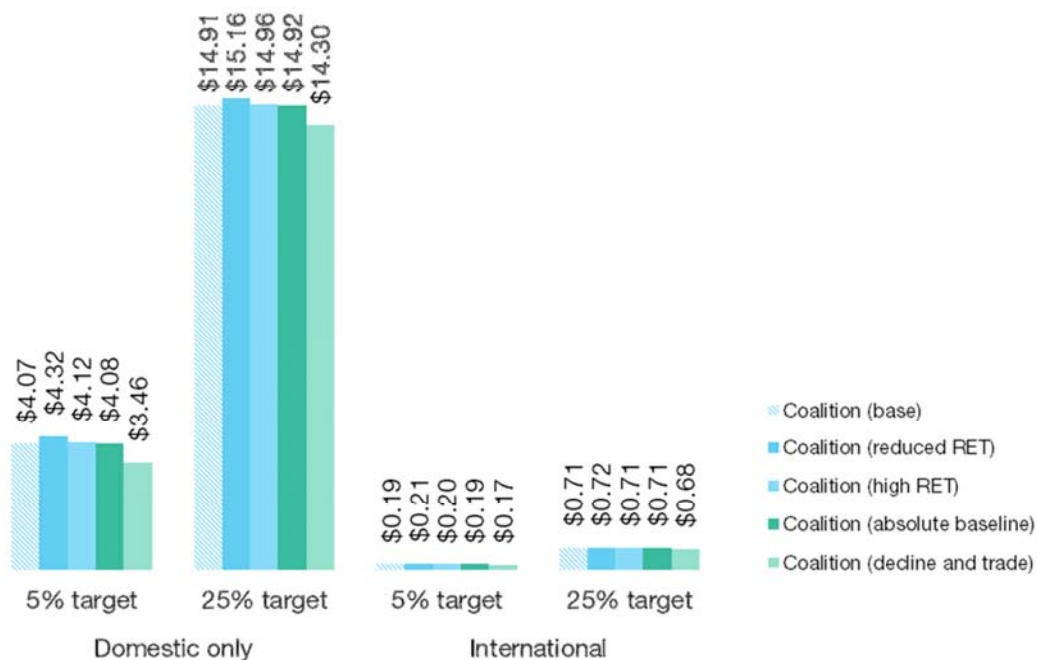
**across scenarios** (million tonnes of CO<sub>2</sub>e).

Emission reductions take into account indirect impacts of the policies such as reductions in energy demand due to impacts on power prices, as well as direct impacts.



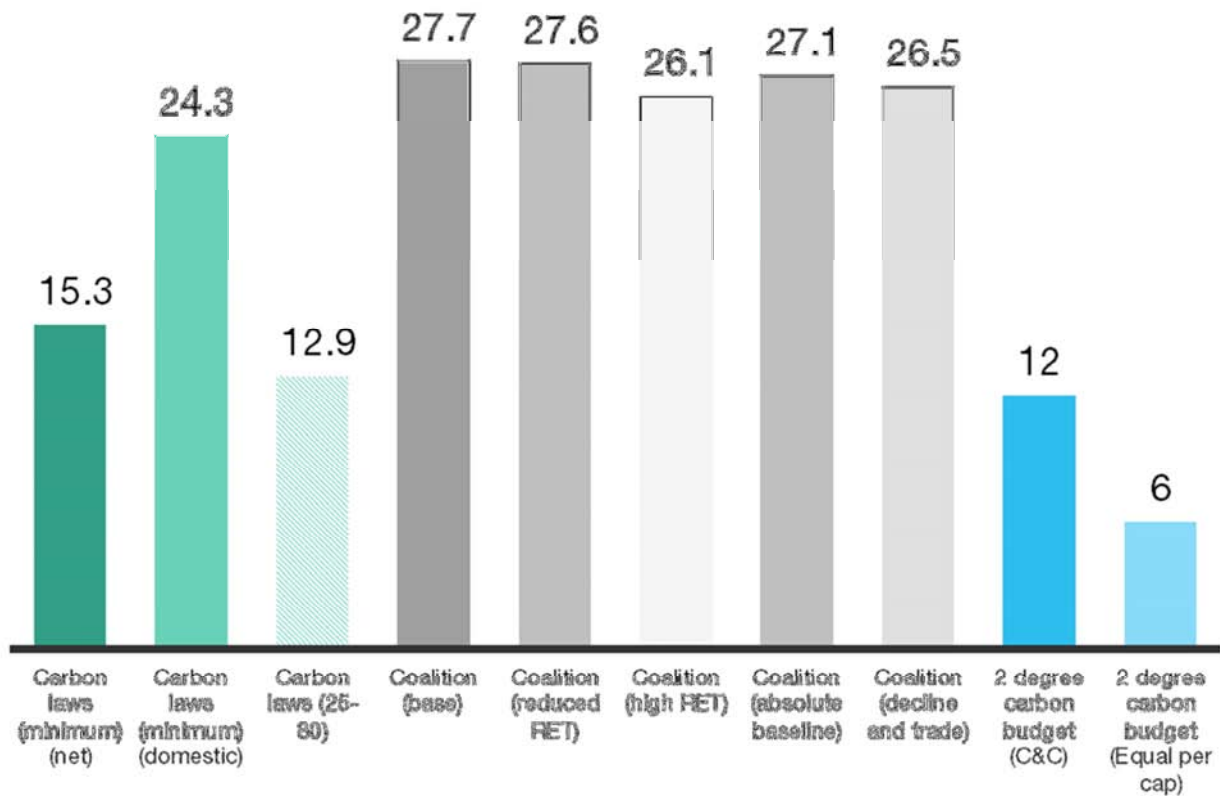
**Figure 6. Additional expenditure required to**

**achieve a given emission target to 2020** (Real 2012 \$billion). International unit imports are based in access to Kyoto carbon markets. Relying solely on these markets to meet a given emission target would not be credible domestically or internationally.



**Figure 7. Emissions vs 2°C carbon budgets.**

Total emissions over the period from 2012–2050 are compared to two national carbon budgets under scenarios where Australia makes a more equitable contribution to avoiding a 2°C increase in global temperatures. The 2 °C carbon budgets are based on two different approaches to more fairly sharing the global carbon budget: contraction and convergence ('C&C'), where per capita emissions converge in 2050, and an equal per-capita budget ('Equal per cap') where Australia does not emit more on a per capita basis than other developed nations. The carbon laws 25–80 per cent scenario assumes the Climate Change Authority recommends a 25 per cent reduction by 2020 and this is accepted by the Government. It also assumes the 80 per cent reduction by 2050 is the minimum long-term reduction.



### **Comparing results with other analyses of Coalition policy: why the differences?**

It is important to note that other analyses, including one undertaken in 2010 for The Climate Institute<sup>28</sup>, has found that the Coalition's policy could see much larger emission increases in 2020.<sup>29</sup>

This is in part explained by different estimates of the size of the emission reduction task to 2020. For example, Government projections suggest that to achieve the emission targets in the absence of a carbon price requires around 755 to 1,265 million tonnes of emission reductions to 2020.<sup>30</sup> This may be an overestimate, as it does not consider recent changes in electricity consumption and economic growth. Energetics estimates that 275 million tonnes of emissions reductions to 2020 would achieve the minimum 5 per cent target.<sup>31</sup>

SKM-MMA's projections suggest an abatement challenge less than the Government projections but higher than Energetics: around 370 million tonnes to 2020.<sup>32</sup>

This modelling also makes a number of assumptions that are fairly generous to the Coalition's proposal. First, it assumes that the ERF and the associated baseline and carbon penalty scheme can be established by mid-2014. If the Coalition does not control both houses of Parliament repeal of the existing carbon laws is unlikely before the end of 2014/early 2015.

The modelling also assumes that all the emission reduction projects are delivered to schedule and achieve anticipated emission outcomes.

International and domestic experience shows that it is difficult to prove that all the projects that occur under approaches similar to that proposed by the Coalition are truly additional and would not have occurred anyway (see for example Table 2).

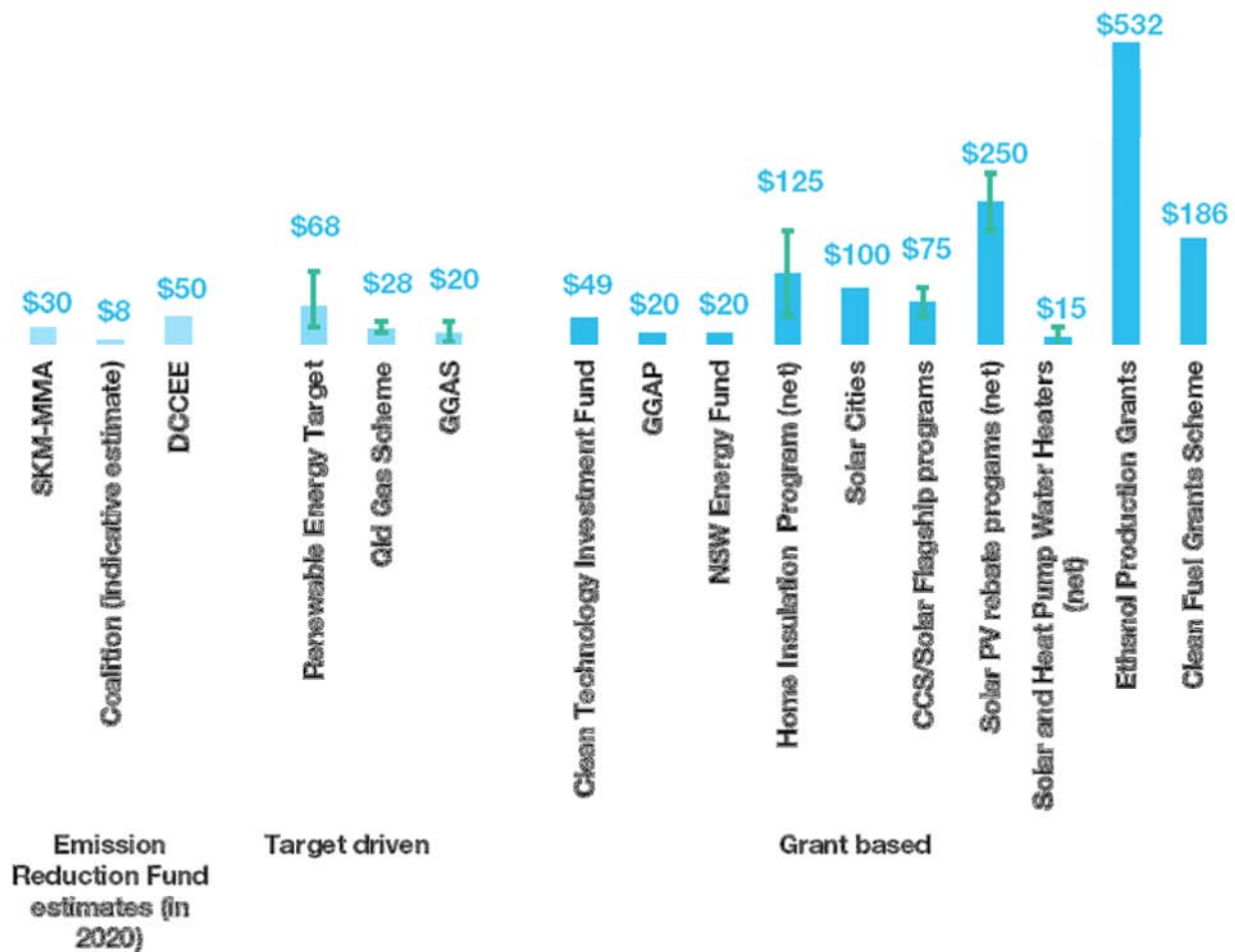
For example, under the Clean Development Mechanism, which has taken years to develop and has implemented increasingly stringent accounting frameworks<sup>33</sup>, analysis suggests that around 20-30 per cent of renewable projects supported would have occurred regardless of the mechanism<sup>34</sup>. If this proportion were to apply to the Coalition's policy another 40-60 million tonnes of emission reductions would be needed to achieve agreed international targets.

Additionally, the modelling presented here suggests the marginal cost of reducing emissions under the ERF will be lower than other estimates. SKM-MMA modelled a marginal cost of abatement of around \$30/tonne in 2020. In comparison, the former Department of Climate Change and Energy Efficiency estimated the policy's marginal cost of abatement to be \$50/tonne in 2020 (*Fig. 8*).<sup>35</sup>

The difference is explained by SKM MMA's assumption that the reverse auction process proposed by the Coalition will deliver some projects at lower cost per tonne than others and that this will be reflected in Government payments. Treasury notes that this can lower the cost of the scheme.<sup>36</sup> However, Departmental analysis has also concluded that bidders will act strategically to maximise the returns on projects and this will lead to a higher fiscal cost than actual emission reduction costs. For example, firms bid higher than their actual project costs but just lower than that of their competitors.

**Figure 8. Indicative comparison of estimates of dollars per tonne emission reductions for ERF and other low emission programs. ERF estimates are based on SKM MMA modelling, initial estimates by the Coalition<sup>37</sup> and other independent analysis.<sup>38,39</sup> Cost per tonne of existing and past programs is based on Grattan Institute<sup>40</sup> and the Productivity Commission<sup>41</sup>. Grant-based programs and programs driven by legislated targets and not reliant on Government funding are grouped. Note that costs are not directly comparable as different assumptions are used in different analysis, so this should be seen as an indicative comparison.**

Source: The Climate Institute analysis based on SKM-MMA, 2013; Coalition, 2009; The Australia Institute, 2011; Grattan Institute, 2011 and Productivity Commission, 2011.



## Boosting low carbon investment

*A great competitive margin in the world is going to be over carbon and energy productivity. Countries that slip behind... are going to damage themselves and their competitiveness and prosperity in the coming years.*

**Lord Nicholas Stern**

Launch of The Climate Institute's  
*Global Climate Leadership Review*  
March 2013

Maintaining economic competitiveness in a world limiting carbon emissions requires continually increasing the value of each tonne of carbon emitted, or in other words, increasing carbon productivity.<sup>42</sup> The level of a country's carbon productivity is a high-level indication of that country's ability to prosper in a world where carbon emissions are constrained.

Improvements in carbon productivity are largely driven by two key factors: improvements in energy productivity, whereby more value is generated from the energy used, and reductions in the carbon intensity, whereby the pollution produced by outputs is reduced.<sup>43</sup>

Energy efficiency is an important element of energy productivity: reducing the amount of energy required per unit of output lowers the production cost per unit. (Other factors driving energy productivity are energy prices and economic structure.)

In the face of a long-term rise in fuel and carbon prices, cutting input costs through more efficient energy use can become an important source of productivity and competitive advantage for companies. Similar benefits accrue to national economies: energy efficiency decreases spending on fuel and energy infrastructure, can suppress energy prices and stimulates economic growth.

New research by Vivid Economics, commissioned by The Climate Institute and industrial giant GE, has found that a 1 per cent increase in the level of a country's energy efficiency causes a 0.1 per cent increase in the rate of economic growth per person in that year.<sup>44</sup> Applying this relationship to projections for Australia, an annual 1 per cent increase in energy efficiency would boost 2030 GDP per capita by 2.26 per cent or \$1,200 per person, and total GDP by \$26 billion.

### **Modelled impact on Australia's carbon competitiveness**

The modelling finds that the Coalition policy scenarios slightly improve carbon productivity of the economy over the coming decades. By 2020 economic output per unit of carbon emissions is increased by around 6.4 per cent. This is around a third less than the improvement driven by the carbon laws.

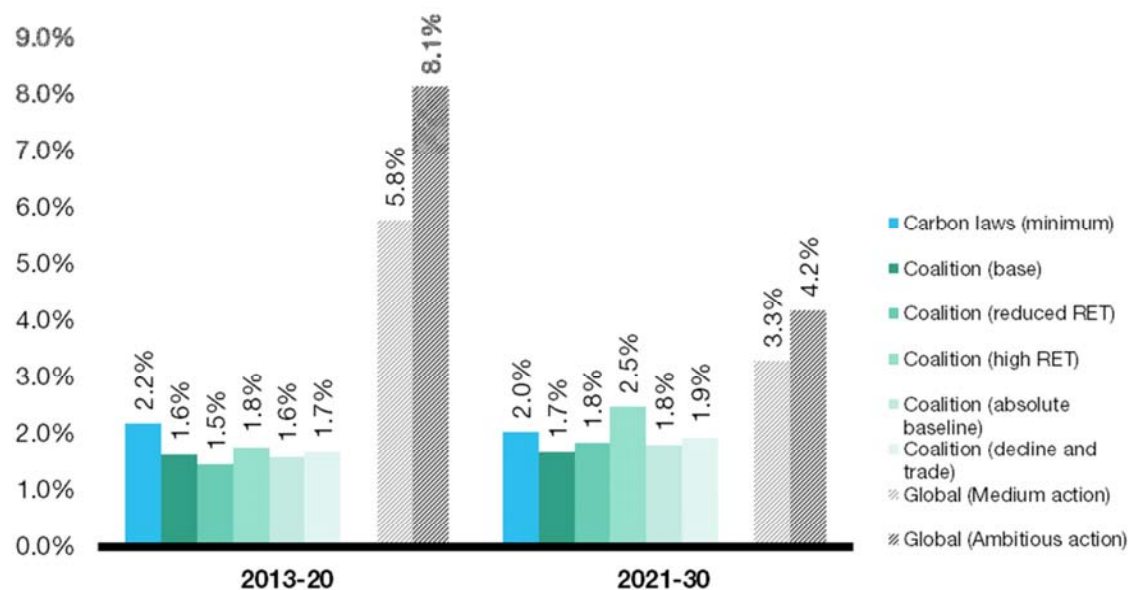
Over the period to 2030, the carbon laws roughly double the current rate of carbon productivity improvement while the Coalition policy scenarios see little improvement over a scenario where no action is taken. Neither the carbon laws nor the Coalition policy scenarios match global rates of improvements implied by Treasury modelling of a world limiting carbon emissions<sup>45</sup> (*Fig. 9*). Similar results are observed for changes in the carbon intensity of the economy.

It is likely that change in the emission intensity of energy is the key driver of overall carbon productivity (*Fig. 10*). Both parties' policies improve Australia's energy productivity, although not to levels implied by the targets of other major economies (*Fig. 11*). For example, in 2020 energy productivity under the current laws and the Coalition's policies is projected to be around 25 per cent below that implied by the USA's policy commitments.

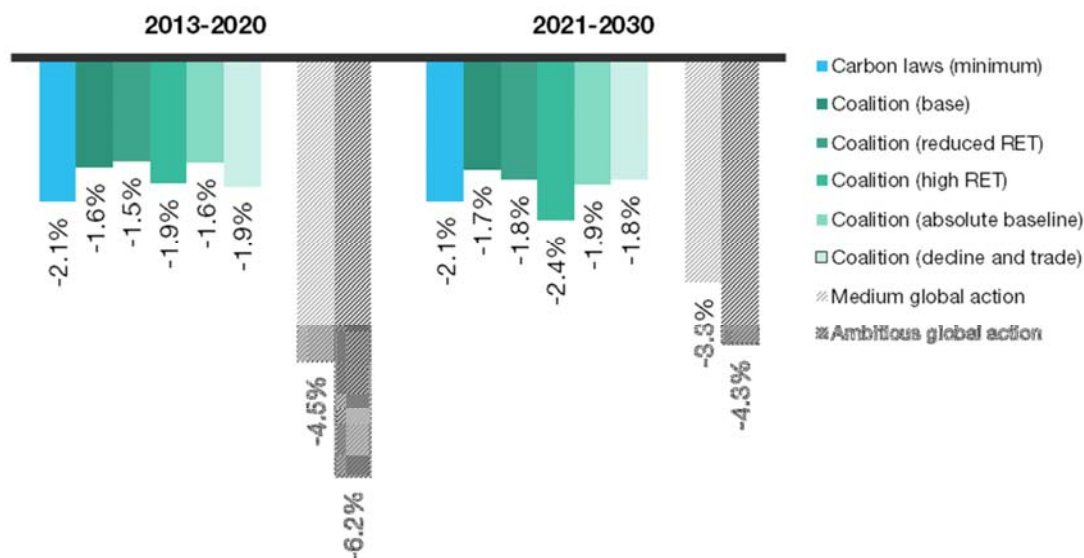


**Figure 9. Average annual rate of change in carbon productivity by decade.** The average annual rate of improvement in carbon productivity of the Australian economy is shown for the full range of scenarios assessed. Global rates of change based on Treasury's previous global modelling of a medium and ambitious global action are also shown as indicative comparisons.

**Figure 9 & 10 Source:**  
The Climate Institute analysis based on SKM MMA, 2013 and Treasury, 2011

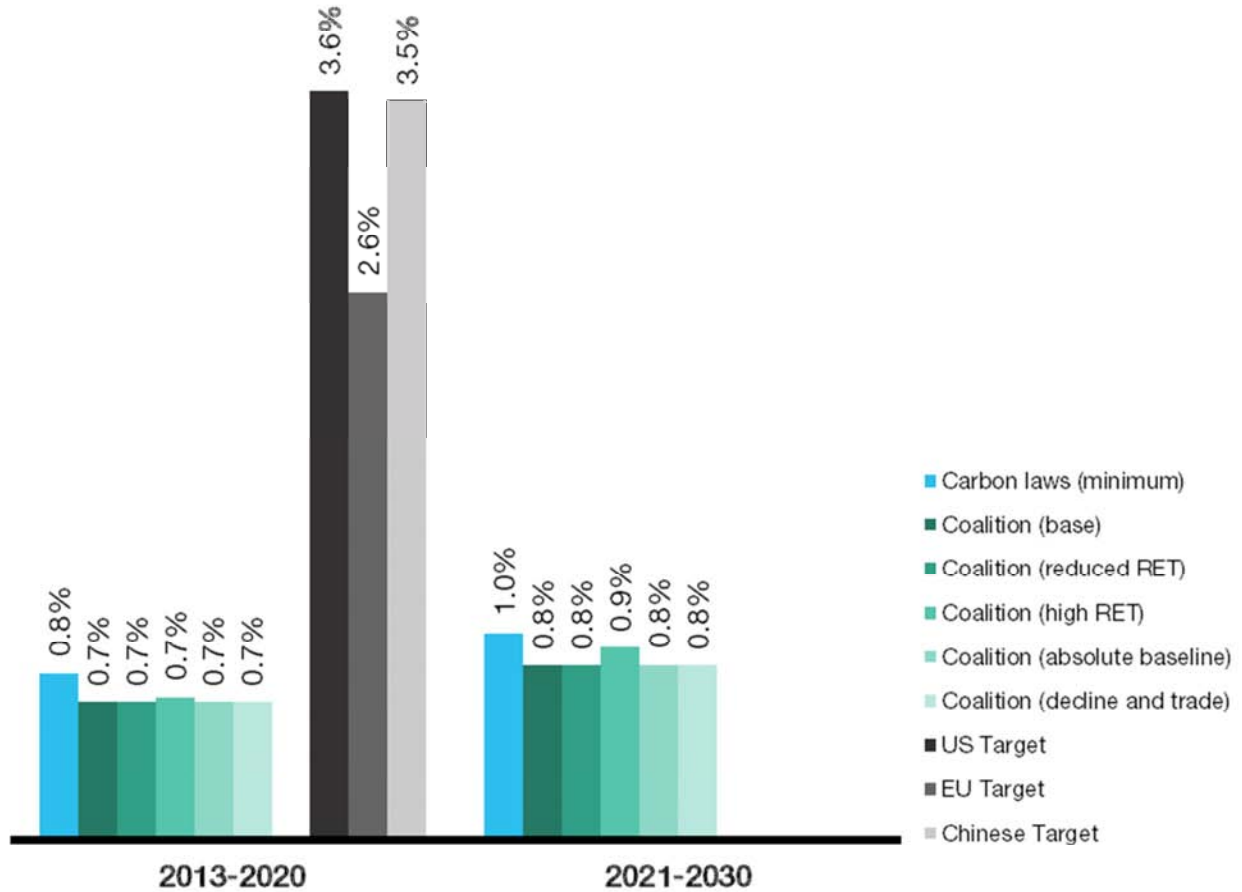


**Figure 10: Average annual rate of change in carbon intensity by decade.** The average annual rate of decline in carbon intensity of the Australian economy is shown for the full range of scenarios assessed. Global rates of change based on Treasury's previous global modelling of a medium and ambitious global action are also shown as indicative comparisons.



**Figure 11. Average annual rate of change in energy productivity by decade.** Australia's projected change in energy productivity is also compared to targets being implemented in the USA, the EU and China.<sup>46</sup>

Source: The Climate Institute analysis based on SKM-MMA, 2013; International Energy Agency, 2012; US Department of Agriculture, 2012; US Energy Information Agency, 2012 and Department of Resources, Energy and Tourism, 2013.



### Policy impact on renewable energy generation

The impact of the different Coalition options on renewable energy generation is driven by the interaction between two key factors: changes to the Renewable Energy Target and removal of the carbon price in 2014.

The carbon price increases the viability of renewable investments by raising the wholesale electricity price, reducing the need for renewable energy certificates generated under the legislated target, and hence reducing the certificate price. As liable parties under the Renewable Energy Target can choose to pay a penalty instead of purchasing renewable energy certificates, the penalty price acts as a cap on the value of certificates. With no carbon price, paying the penalty becomes an increasingly economic option once the price of renewable certificates reaches parity with the penalty. At this point firms pay the penalty and do not invest in renewable generation.

With the Renewable Energy Target unchanged, the Coalition's policy to remove the carbon price forces renewable energy certificates up to the penalty threshold and reduces renewable energy generation to 22 per cent by 2020, compared with 24 per cent under the current legislation.

This produces an equivalent result to reducing the RET (whereby the target is shifted to 25 per cent renewable generation by 2025).

Reducing the RET costs an additional \$250 million in emission reductions needed to reach the minimum target.

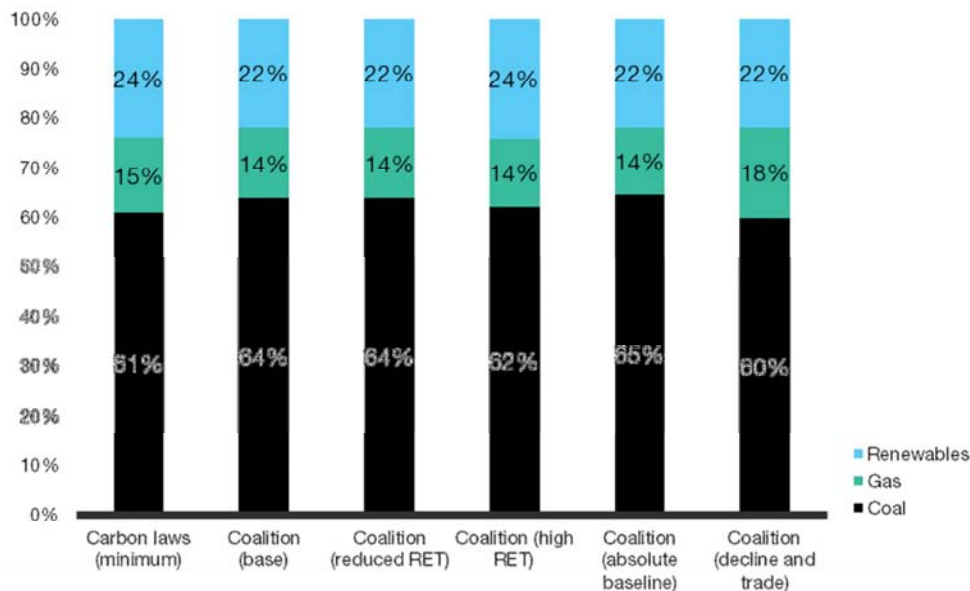
Other analysts have pointed out that reducing the RET also increases wholesale electricity prices and increases investment risk premiums. For example, modelling by Bloomberg New Energy Finance shows that most of the drop in cost of a reduced RET is offset by an increase in wholesale electricity costs.<sup>47</sup> The combined costs of additional emissions reduction and wholesale electricity suggest there is no material economic benefit resulting from a reduced RET.

The impact of removing the carbon price is most stark in the scenario where the Renewable Energy Target is increased to 50 per cent by 2030 ('High RET'). While more renewable energy is achieved than in other scenarios, investment in renewable generation falls well short of the target.

In the longer term, without a high carbon price there is also no incentive to adopt carbon capture and storage technologies and these are not deployed in the Coalition scenarios. Under the current carbon laws, on a cumulative basis to 2050, approximately 3 per cent of generation is from coal sources is equipped with CCS and with around 5 per cent of gas. This is all deployed after 2030.

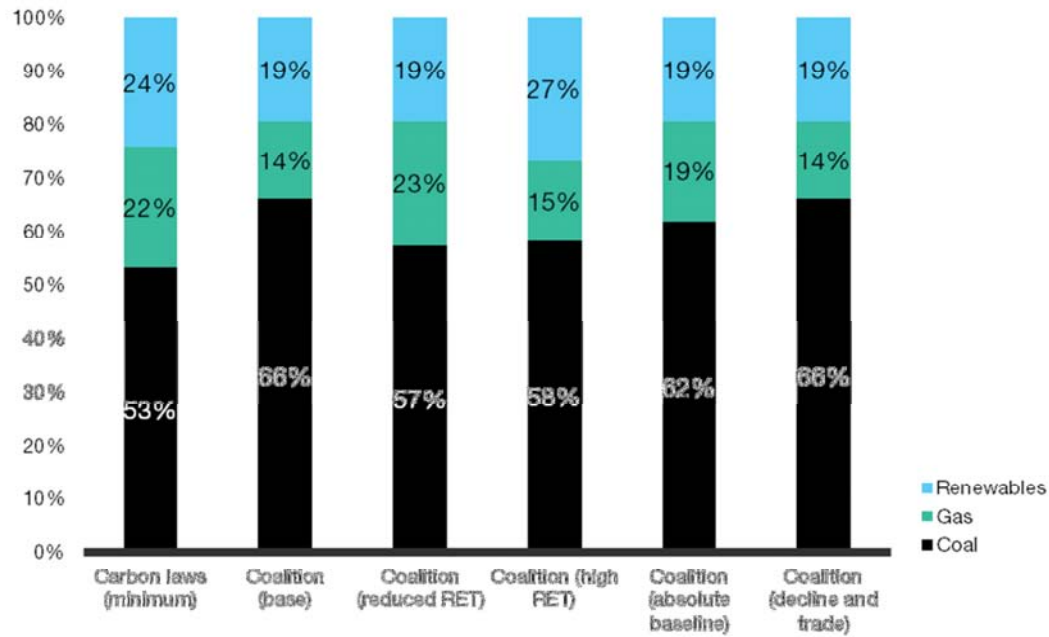
**Figure 12. Projected electricity generation: 2020.**

Source: The Climate Institute analysis based on SKM-MMA, 2013



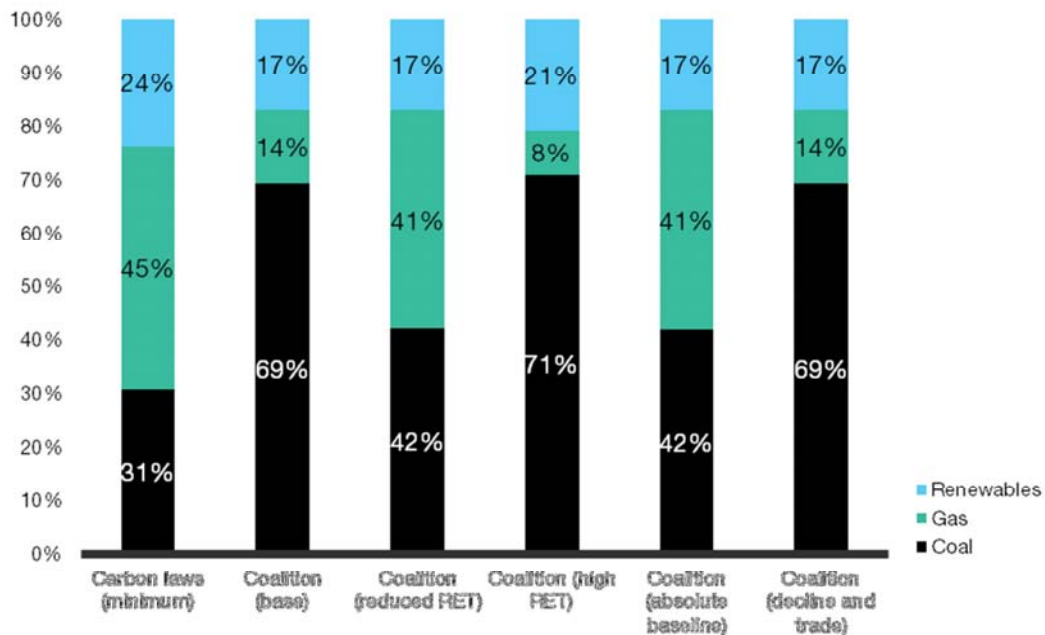
**Figure 13. Projected electricity generation: 2030.**

Source: The Climate Institute analysis based on SKM-MMA, 2013



**Figure 14. Projected electricity generation: 2050.** Note that under the Carbon laws around 35 per cent of projected thermal generation uses carbon capture and storage (CCS). Without a carbon price to make CCS investments viable the technology is not deployed in the Coalition scenarios.

Source: The Climate Institute analysis based on SKM-MMA, 2013



# Discussion

## Questions of scale, diplomacy and transformation

Australia has defined its national climate interest as avoiding a 2°C increase in global temperature above pre-industrial levels. This is a goal which both major political parties share and one to which over 190 nations have agreed.

This is the ultimate test against which parties' proposed policy must be assessed. Does the policy allow Australia to play its fair part in global efforts to achieve this outcome?

Specifically, is the policy scalable to enable emission reductions of 25 per cent by 2020 and in the order of 60 per cent by 2030? Does the policy position the Australian economy to manage the risks and opportunities of a world seeking to avoid this level of dangerous climate change? Does the policy position Australia to play a constructive role in building global ambition and facilitating international investment in low-pollution technologies?

The Coalition's climate change policy, as it is currently outlined, is unlikely to help deliver Australia's national climate interest.

Based on The Climate Institute's analysis, the core challenges confronting the Coalition are that the current proposed policy framework:

- + increases emissions and lacks scalability
- + risks undermining Australia's positive influence internationally and undermining global action
- + does not make emitters responsible for their pollution, effectively subsidising high carbon behaviours

### **Increases emissions and lacks scalability**

The independent modelling presented here suggests that, across the range of Coalition policy permutations, Australia's emissions will continue to increase to 2020 and beyond. Across the Coalition policy scenarios, emissions increase in the order of nine per cent on 2000 levels by 2020. This is broadly consistent with other analyses.

With unlimited funds and seamless policy implementation the Coalition's policy frameworks could theoretically achieve Australia's 5 to 25 per cent reduction targets by 2020.

However, beyond the practicality of implementing the proposed policy framework, the core issue remains that the policy constrains budget expenditure but doesn't constrain emissions. The money available, based on all independent analysis to date, is insufficient to reduce Australia's emissions in line with the bipartisan supported target range.

The scalability of the ERF is even starker after 2020. Even with ongoing and increasing budgetary outlays in the order of \$88 billion to 2050, in modelled scenarios emissions continue to rise around 45 per cent above 2000 levels over this timeframe.

The international community is currently negotiating a new global agreement to limit emissions from all major emitters. This agreement will set the nature of post-2020 emission reductions commitments for all major economies. Any new commitment for the post-2020 period for Australia will very likely be significantly more

stringent than the current 5–25 per cent 2020 targets. This underscores the need to ensure the nation can deliver much deeper reductions in a little over a decade than currently pledged. It will place significant pressure on the 2015 Coalition review to revisit emissions trading in 2015 when it reviews its policy framework.

## Risks undermining Australia's positive influence internationally

The credibility and ambition of Australia's domestic policy settings will become more important under the new 2015 agreement.<sup>48</sup> A policy that can meet stated international targets is central to strengthening the emerging architecture, building global ambition, and avoiding negative responses from other major economies.

Ratifying the Kyoto Protocol and establishing the current carbon laws with scalable pollution limits allows Australia to play a more proactive and positive role in brokering agreements between different negotiating blocs. For example, Australia's credibility in ratifying Kyoto's first commitment period and introducing carbon bills was central to its role in establishing the Cartagena Dialogue. The Cartagena Dialogue brings together progressive countries spanning the developing and developed world to explore areas of convergence in country positions and find potential areas of joint action.<sup>49</sup> The Cartagena Dialogue played a pivotal role, for example, in securing the Cancun Agreement in 2010.

To further illustrate the point, Australia's economy looks very similar to Canada's, in that both countries are large, advanced, Anglophone resource producers. However, unlike Canada, Australia has 'skin in the game' of international climate policymaking. Australia's participation in the Kyoto Protocol and enacted domestic policies means we are more credible and have more leverage than Canada. This diplomatic capacity and political leverage provides a progressive voice, in contrast with some of our more regressive counterparts.

In short, Australia's ability to achieve internationally committed targets will influence both its posture and its role in international negotiations. This matters in three main fronts in particular:

- + **International posture.** If the Government does not have credible domestic policy settings that allow it to meet international commitments it will, at best, force the nation into a defensive position internationally. At worst, it would force the Government into a regressive position where the country walks backward on current commitments and actively works with similar nations to undermine the development of a robust and ambitious international framework.
- + **Works against some business interests.** Like the Government, the Coalition has committed to implement policies to reduce emissions. This imposes a (small) cost on the economy. It is therefore in Australia's interest to pursue active diplomacy to ensure other countries are similarly implementing policies to reduce emissions. This effort is weakened by not having a credible domestic policy framework in place.
- + **2014: the year of ambition.** Under the Kyoto Protocol, which enjoys bipartisan support, Australia has signed an agreement to take on a new binding international emission reduction commitment spanning the period from 2013–2020. This agreement includes a process to lift the ambition of these commitments in 2014.<sup>50</sup> The UN Secretary General is also convening a meeting of world leaders in 2014 to build short-term emissions ambitions and momentum for the new 2015 climate agreement. The 2014 G20 meeting is an opportunity for Australia to facilitate emerging ambition and build on strengthening climate co-operation among major emitters China and the United States. Australia's support for a stronger emission target will be

influential among other middle powers and provide a counterpoint to regressive actions by countries seeking to weaken ambition. The opposite is also true.

## Does not make emitters responsible for their pollution

The ability of the ERF to deliver broad scale investment in low-pollution activities is undermined by three main factors:

- + Subsidising carbon pollution;
- + Lack of a broad-based investment incentive;
- + Limited impact on the competitiveness of coal and other emission intensive activities.

### Subsidising carbon pollution

The International Monetary Fund estimates that Australia's 2011 post-tax subsidies to fossil fuels equate to around 2 per cent GDP and around 6 per cent of Government revenues.<sup>51</sup> This includes the subsidy associated with not pricing carbon (at that time) in line with US government estimates of cost of climate change impacts of around A\$27/tonne. This US benchmark has been recent increased and may be a substantial underestimation of the cost of climate change. For example, the Canadian Government uses climate impacts costs of up to A\$120/tonne in regulatory impact analysis.<sup>52</sup>

The IMF concludes that energy subsidies generally have wide-ranging economic impacts and that:

*Negative externalities from energy subsidies are substantial. Subsidies cause overconsumption of petroleum products, coal, and natural gas, and reduce incentives for investment in energy efficiency and renewable energy.*

The Coalition's policy currently does not include a broad-based price on carbon emissions as the carbon penalty applies only to emissions above yet-to-be-determined business-as-usual baselines. This implicitly subsidises below baseline emissions.

Using a similar approach to that used by the IMF, The Climate Institute calculates that this subsidy equates to around \$50 billion to 2020 and 0.4 per cent of GDP over this period.

Note that even with the emissions penalty, in most modelled Coalition scenarios firms largely avoid paying the carbon price because it is set in way that applies only if companies undertake activities that exceed business as usual levels. However, through time industries naturally become more efficient and adopt more productive technologies and practices. These means that they do not generally exceed the baseline set in the modelling. This appears to be the intent of the Coalition's policy.

In the scenario where baselines decline over time companies play the penalty and/or purchase a domestic or international emission offset for a higher proportion of their emissions. In this case, a limited direct carbon prices applies, albeit on only a small proportion of emissions. Stronger reductions in intensity baselines than presented here could increase penalty payments and provide a stronger incentive to investment in emission reduction activities.

### Lack of a broad based investment incentive

The replacement of the carbon laws with the ERF removes two broad-based incentives to investment in low-emissions technologies.

The first incentive is the direct carbon price itself, which applies to a wide range of sources of emissions and changes the relative costs and benefits of all emitting activities. In contrast, under the ERF the scope of the available emission reductions is limited by budget expenditure.

The second incentive is the impact of the carbon price on energy prices. The removal of a carbon price will reduce energy prices and consequently reduce the uptake of energy efficiency and renewable energy unless other equivalent incentives are provided. While energy demand is not highly responsive to changes in price in the short term, price increases do affect demand in the medium to long term. In the modelling, energy efficiency is reduced by 0.8 per cent in cumulative terms to 2050 without a carbon price in place.

**Limited impact on the competitiveness of coal and other emission intensive activities**

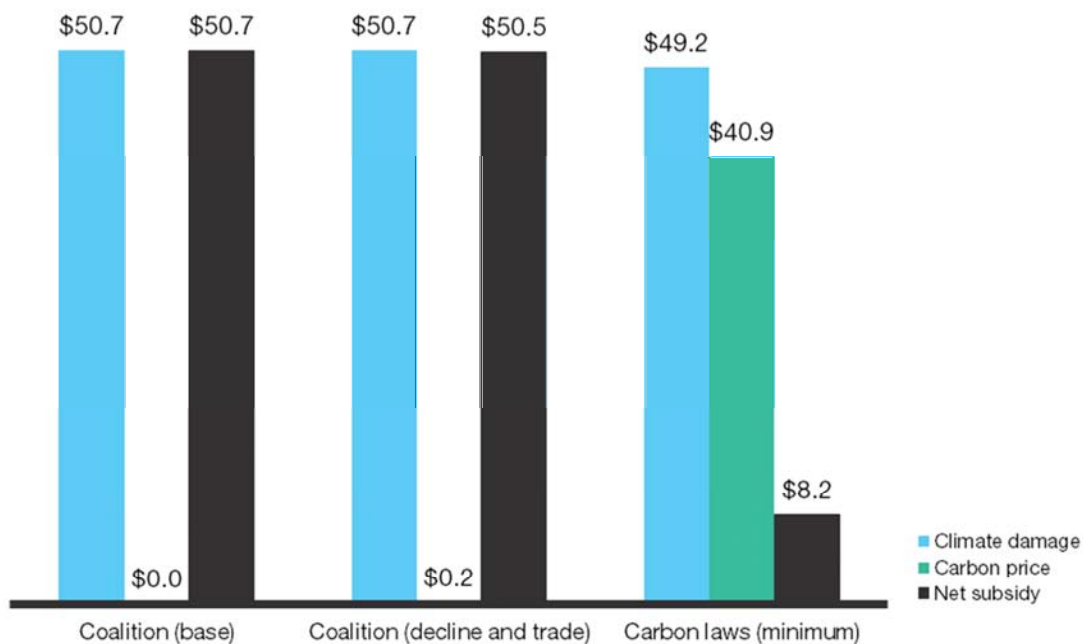
The ability of emission intensive firms to pass on carbon price costs is to a greater or less extent limited by competitive pressures in the market. For example, estimates and experience show that coal-fired generators will be able to pass on only a proportion of their carbon costs to energy consumers.<sup>53</sup> The Australian Industry Group has estimated that businesses in the manufacturing, services and construction sectors have initially passed through just 6 per cent of their self-estimated carbon costs in the first year of carbon pricing.<sup>54</sup>

This means that in order to remain competitive in the markets in which they operate emissions-intensive firms must absorb some or all of their carbon costs, and will be less profitable, unless they can reduce their emissions intensity.

To illustrate: without a broad based carbon price coal-fired generation continues to supply around 60-70 per cent of electricity generation. This is the case even in scenarios where the Renewable Energy Target is expanded. While there is certainly a reduction in coal-based generation in these scenarios, in the absence of carbon pricing, the very low cost of brown coal generation remains competitive for many decades.

**Figure 15 Climate damages, carbon prices, and subsidies in the stationary energy sector: 2013–2020 (NPV \$billions).** Climate damages are calculated using the same method used by the IMF. Total emissions are multiplied by the social cost of carbon emissions used by the US Government.<sup>55,56</sup> Carbon prices are calculated by multiplying emissions by the carbon pricing applied to them under each scenario. In the case of the Coalition's policies this is the penalty paid for exceeding baselines. To generate the net subsidy carbon pricing is subtracted from climate damages over the period to 2020.

Source: The Climate Institute analysis based on SKM-MMA, 2013





---

# Conclusions

## Developing the National Climate Interest

---

Based on The Climate Institute's and other independent analysis of the Coalition Emission Reduction Fund we recommend that the Coalition consider the follow steps.

### Cutting pollution

All independent analysis to date indicates that the ERF in its current form cannot deliver emission reductions consistent with a 5 per cent reduction let alone the potential for a 25 per cent reduction to which the Coalition has also committed. This contrasts the current carbon laws which, depending on the ambition of the emission cap to be set in 2014, can achieve up to a 25 per cent reduction in emissions by 2020.

The Coalition should make a firm commitment maintain the current legislative framework at least until the completion of detailed policy development and further independent analysis of the potential of the Emission Reduction Fund to achieve up to a 25 per cent reduction in emissions on 2000 levels by 2020. This should also include examination of the ERF in the context of Australia's fair share of a long term global carbon budget consistent with helping to meet the national climate interest of avoiding a 2°C increase in global temperature.

This independent analysis should include:

- + Subjecting the Emission Reduction Fund and associated climate policies to rigorous Regulation Impact Statement as outlined in the Coalition's Policy to Boost Productivity and Reduce Regulation.<sup>57</sup> This should include consideration of the social cost of carbon<sup>58</sup> and post-tax subsidies to emitting behaviours<sup>59</sup>.

- + The White Paper process that is proposed to develop the specific details of the policy should involve Treasury undertaking an independent modelling of emission reductions associated with proposed ERF frameworks. This modelling should examine scenarios to expand the scope and scale of the ERF to include Government purchase of credible international emissions units to ensure Australia's international obligations are achieved.
- + Respecting the currently legislated review by the Climate Change Authority of Australia's carbon emission caps, budgets and targets. This review aligns with international processes in 2014 to increase emission reductions ambitions before 2020 and should be a key input into the ERF White Paper process and Australia submissions on pre-2020 ambition under the Kyoto Protocol.

### Boosting low carbon investment

The key barrier in the short term to boosting low-pollution investment is removing the policy uncertainty created by a two-year review of the Renewable Energy Target.<sup>60</sup> The Coalition should commit to remove the legislated 2014 and focus the 2016 review on post-2020 policy settings.

In addition, alongside any policy development of the ERF, the Coalition should explicitly consider setting declining emission baselines and carbon penalties for covered firms that is consistent with driving sustained decarbonisation of major emitting sectors.

Finally, if committed to remove the current legislated framework, given the broad-based

subsidisation of polluting activities, limited public funds to drive investment, and a declared preference not to pursue broad market-based measures, the Coalition should examine additional regulatory approaches to drive structural change in the economy.<sup>61</sup> This would include:

+ **Expand the Renewable Energy Target.**

Active consideration should be given to legislating a 2030 fixed GWh target to ensure around 50 per cent of generation is renewable energy. The 2020 target would remain unchanged and penalty prices should be adjusted to reflect the change in the 2030 target. Higher targets could be complemented by including carbon capture and storage options as possible suppliers of clean energy certificates.

+ **Regulate a declining emission performance standard for existing power generation.**

This would initially be set to ensure the most emission intensive power generation is decommissioned by 2020<sup>62</sup> and decline through time to ensure by 2030 the power sector is nearing decarbonisation. The United States is now moving to directly regulate emissions from existing power stations; some proposals give power plant owners the freedom to choose how they would meet the required emission standards, for example by giving credit for increases in energy efficiency and electricity generation using renewable energy.<sup>63</sup>

+ **Implement a more consistent, ambitious and stable policy framework to drive a step change in energy efficiency.** Policies to achieve this step-change could include:

- A national energy productivity target of a 30 per cent improvement on 2010 levels.
- Expanding state-based energy saving schemes into a nationally consistent and robust Energy Saving Initiative covering the whole country. Modelling of a national ESI targeting 5 per cent energy savings found potential net benefits of up to \$3.5

billion and emissions reductions of about 30–70 million tonnes by 2050.<sup>64</sup>

- Implementing ambitious emissions or efficiency standards for vehicles equivalent to United States standards by 2015 and European standards by 2020. Europe requires light vehicle manufacturers to meet increasingly stringent limits on CO<sub>2</sub> emissions: for example, new car fleets must average 130 g CO<sub>2</sub>/km by 2015 and 95g/km by 2020. Benefits to consumers from reduced fuel usage over the vehicle life are estimated at \$2,500.<sup>65</sup>
- Using the new national framework for regulating Minimum Energy Performance Standards (MEPS) to drive more ambitious equipment standards. One method would be to adapt Japan's 'Top Runner' program, where ever-higher performance standards are set by the most energy-efficient products.<sup>66</sup>
- Pricing that more accurately reflects the true costs of energy use: time-of-use and critical peak electricity pricing; removal of fossil fuel subsidies and pricing of externalities (e.g. reform of fuel tax system to fully address costs over and above road use).
- Strengthen the implementation of identified energy efficiency opportunities requirements under the energy Efficiency Opportunities program for large energy users. Analysis of participants' data has found that around 60 per cent of identified energy savings are not implemented, resulting in energy waste worth \$2 billion per year, and additional emissions of approximately 8.5 Mt CO<sub>2</sub>.<sup>67</sup>
- National implementation of mandatory energy efficiency disclosure at point of sale or lease to residential buildings. There has been no progress on this element of the COAG-agreed National Strategy for Energy Efficiency.<sup>68</sup> Also consider targeting a certain proportion of the ERF towards retrofitting the existing building stock.

## Endnotes

- <sup>1</sup> The Climate Institute, 2013. *The 2013 Pollute-o-meter* [website], <http://www.2013pollute-o-meter.org.au/>.
- <sup>2</sup> The Climate Institute, 2013. *Managing the Unavoidable while Avoiding the Unmanageable*. Policy brief, The Climate Institute, Sydney.
- <sup>3</sup> SKM MMA, 2013. *Emission Reduction Fund Policy Review*. SKM MMA, Melbourne.
- <sup>4</sup> Olivia Kember and Erwin Jackson with Merry Chandra, 2013. *GHG Mitigation in Australia: An Overview of the Current Policy Landscape*. World Resources Institute, Washington, DC.
- <sup>5</sup> Ross Garnaut, 2008. *The Garnaut Climate Change Review. Final Report*. Cambridge University Press, Melbourne.
- <sup>6</sup> Greame Pearman, 2008. *Climate Change Risk in Australia Under Alternative Emissions Futures*. Report prepared by Graeme Pearman Consulting Pty Ltd for the Australian Government, Treasury, Canberra.
- <sup>7</sup> International Monetary Fund, 2013. *Energy Subsidy Reform: Lessons and Implications*. IMF, Paris.
- <sup>8</sup> Ongoing international talks continue on the role of investment in reducing emissions in deforestation and degradation under international accounting rules. Until these roles are defined, the Coalition's investment cannot count toward Australia's national emission reduction target. It can, however, count toward Australia's contribution to international financing.
- <sup>9</sup> Simon Birmingham, 2013. *Address by Simon Birmingham, Shadow Parliamentary Secretary for the Environment*. Clean Energy Week, 24 July, Brisbane.
- <sup>10</sup> Bloomberg New Energy Finance, 2013. *H1 2013 Australia Clean Energy Market Outlook*. BNEF, Sydney.
- <sup>11</sup> See Liberal/National Parties of Australia. 2010. *The Coalition's Direct Action Plan*. LNP, Canberra; Greg Hunt, 2013. *Direct Action Plan on Environment and Climate Change*. Speech to the ANU Crawford School of Public Policy, Canberra; Grattan Institute, 2013. *The Coalition's Climate Change Strategy*. Transcript of public forum. Grattan Institute/Melbourne Energy Institute, Melbourne.
- <sup>12</sup> Ernst & Young, 2011. *Independent evaluation of alternative climate change policies against the Australian Industry Group's Climate Change Policy Principles, Report to the Australian Industry Group*, Ernst & Young, Australia.
- <sup>13</sup> Department of Climate Change, 2010. *Analysis of Coalition Climate Change Policy Proposal*. Commonwealth of Australia, Canberra.
- <sup>14</sup> Treasury, 2011. *Economic and Fiscal Impact of the Coalition's Direct Action Plan*. Treasury Executive Minute, Commonwealth of Australia, Canberra.
- <sup>15</sup> McLennan Magasanik Associates, 2009. *Baseline and Credit versus Cap and Trade Emissions Trading Schemes*. Policy Brief for The Climate Institute, MMA, Melbourne.
- <sup>16</sup> Richard Denniss and Matt Grudnoff, 2011. *The Real Cost of Direct Action: An analysis of the Coalition's Direct Action Plan*. The Australia Institute, Canberra.
- <sup>17</sup> Allens, 2013. *Focus: The Opposition's Direct Action Plan*. Allens, Brisbane/Melbourne/Sydney.
- <sup>18</sup> It also does not include Japan's Bilateral Offset Mechanism as this is an international offset mechanism to promote Japanese technologies and companies. The Coalition has said it will not use international permits to achieve its minimum target.
- <sup>19</sup> Expenditure figures are compiled from Commonwealth portfolio budget papers 2000/01 to 2013/14. They include, as far as it is possible to discern them, all climate- and energy-related programs, including research and development, program administration, and schemes that forego tax revenue.
- <sup>20</sup> SKM MMA, *Emission Reduction Fund Policy Review*.
- <sup>21</sup> Vivid Economics, 2013. *The costs and benefits of greater Australian emissions reduction ambition*. Report prepared for WWF - Australia, Vivid Economics, London.
- <sup>22</sup> SKM MMA, *Emission Reduction Fund Policy Review*.
- <sup>23</sup> Unless otherwise stated all dollar numbers are in real 2012 \$A.
- <sup>24</sup> This uses a relatively conservative approach to calculating the additional expenditure by assuming the additional emission reductions can be achieved at a similar price to those already invested in under the EFR (around \$30/tonne in 2020). Treasury has suggested a carbon price of \$80/tonne may be more appropriate (see endnote 14).
- <sup>25</sup> For discussion of carbon budgets and Australia's fair contribution to avoiding a 2°C increase in global temperature see The Climate Institute, 2013. *Operating in Limits: Defining an Australian Carbon Budget*. The Climate Institute, Sydney.
- <sup>26</sup> The Climate Institute, 2013. *Australia's emissions budgets, targets, caps and trajectories: response to the Climate Change Authority's Caps and Targets Review Issues Paper*. Submission to the Climate Change Authority, TCI, Sydney.
- <sup>27</sup> This assumes that global per capita emissions converge to levels implied by Australia's per capita emissions in 2050 under the modelled scenarios.
- <sup>28</sup> Karl Mallon and Mark Hughes, 2010. *Climate Policy Analysis Tool, Simulation: The Australian Coalition*. Climate Risk Pty Ltd, Sydney.
- <sup>29</sup> Department of Climate Change, 2010. *Analysis of Coalition Climate Change Policy Proposal*. Commonwealth of Australia, Canberra.
- <sup>30</sup> Department of Climate Change and Energy Efficiency, 2012. *Australia's Emission Projections 2012*. Commonwealth of Australia, Canberra.
- <sup>31</sup> Energetics, 2013. *Australia's greenhouse abatement challenge*. Energetics, Sydney.
- <sup>32</sup> This takes into account recent changes to the accounting rules of Australia's obligations under the Kyoto Protocol, such as the revised Global Warming Potentials of certain greenhouse gases and the recent acceptance of voluntary activities under Article 3.4 of the treaty. It also assumes in the Coalition scenarios that Australia uses its current carryover of emission units from the first commitment period in the second commitment period – around 96 million tonnes over the period 2013-2020. See Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education, 2013. *The Impact of Kyoto Accounting Changes on the QELRO and Targets*. Government of Australia, Canberra; Andrew Macintosh, 2013. *Mitigation Targets, Burden Sharing and the Role of Economic Modeling in Climate Policy*. Working Paper Series 2013/1, Centre for Climate Law and Policy, Australia National University, Canberra.
- <sup>33</sup> Michael Gillenwater and Stephen Seres, 2011. *The Clean Development Mechanism: A Review of the First International Offset Program*. Pew Centre for Global Climate Change, Washington. DC.
- <sup>34</sup> Carbon Trust, 2009, *Global Carbon Mechanisms: Emerging lessons and implications*, Carbon Trust/Climate Strategies, London.
- <sup>35</sup> Department of Climate Change, *Coalition Climate Change Policy Proposal*.
- <sup>36</sup> Treasury, *Economic and Fiscal Impact of the Coalition's Direct Action Plan*.
- <sup>37</sup> Liberal/National Parties of Australia, *The Coalition's Direct Action Plan*.
- <sup>38</sup> Denniss and Grudnoff, *The Real Cost of Direct Action*.

- <sup>39</sup> Department of Climate Change, *Coalition Climate Change Policy Proposal*.
- <sup>40</sup> John Daley, Tristan Edis and Julian Reichl, 2011. *Learning the hard way: Australian policies to reduce carbon emissions*. Grattan Institute, Melbourne.
- <sup>41</sup> Productivity Commission, 2011. *Carbon Emission Policies in Key Economies*. Research Report, Productivity Commission, Melbourne.
- <sup>42</sup> For discussion of low carbon competitiveness and carbon productivity see: The Climate Institute, 2013. *Global Climate Leadership Review* TCI, Sydney; and Vivid Economics, 2011. *Protecting Prosperity - lessons from leading low carbon economies*. Report commissioned by GE Australia, Vivid Economics, London.
- <sup>43</sup> Vivid Economics, *Protecting Prosperity*.
- <sup>44</sup> The Climate Institute, 2013. *Boosting Australia's Energy Productivity*, TCI, Sydney; Vivid Economics, 2013. *Energy efficiency and economic growth*. Report commissioned by The Climate Institute, Vivid Economics, London.
- <sup>45</sup> Treasury, 2011. *Strong Growth, Low Pollution: Modelling a carbon price*. Commonwealth of Australia, Canberra.
- <sup>46</sup> Analysis by The Climate Institute based on SKM MMA, Emission Reduction Fund Policy Review; International Energy Agency, 2012. *World Energy Outlook 2012*, OECD/IEA, Paris; United States Energy Information Administration, 2012. *Annual Energy Outlook 2012*, EIA, Washington, DC; United States Department of Agriculture, 2012. *Real GDP (2005 Dollars) Projections* [online dataset]. Economic Research Service, USDA, Washington, D.C.
- <sup>47</sup> Bloomberg New Energy Finance, 2013. *Investment Hit: The Impact of a Reduced Renewable Energy Target*. Research note, 6 August, Sydney. See also Tim Nelson, James Nelson, Jude Ariyaratnam and Simon Camroux, 2012. *An analysis of Australia's Large Scale Renewable Energy Target: restoring market confidence*. AGL Applied Economic and Policy Research Working Paper No.35, AGL, Sydney.
- <sup>48</sup> The Climate Institute, *Australia's emissions budgets, targets, caps and trajectories*.
- <sup>49</sup> For discussion of the Cartagena Dialogue's role see Ethan Bowering, 2013. 'The Cartagena Dialogue and the Future of the Climate Regime', Australian Institute of International Affairs, *Quarterly Access* 4:4.
- <sup>50</sup> For a review of these processes see Charlotte Cuntz, Christoph Bals and Sven Harmeling, 2013. *Short-term mitigation ambition pre-2020: Opportunities to close the emissions gap*. Germanwatch, Bonn/Berlin.
- <sup>51</sup> International Monetary Fund, *Energy Subsidy Reform*.
- <sup>52</sup> Government of Canada, 2012. *Regulations Amending the Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations*. Government of Canada, Ontario.
- <sup>53</sup> Tim Nelson, Fiona Orton and Simon Kelley, 2012. 'A literature review of economic studies on carbon pricing and Australian wholesale electricity markets', *Energy Policy* 49: 217–224.
- <sup>54</sup> Australian Industry Group, 2013. *Ai Group Survey: Business picks up the carbon tax bill*. Ai Group, Melbourne.
- <sup>55</sup> Working Group on Social Cost of Carbon, 2013. *Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866*. Technical Support Document, United States Government, Washington DC.
- <sup>56</sup> Michael Greenstone, Elizabeth Kopits and Maryann Wolverton, 2011. *Estimating the Social Cost of Carbon for Use in U.S. Federal Rulemakings: A Summary and Interpretation*. MIT Department of Economics Working Paper No. 11-04, Cambridge, Massachusetts.
- <sup>57</sup> Liberal/National Parties of Australia, 2013. *The Coalition's Policy to Boost Productivity and Reduce Regulation*, LNP, Canberra.
- <sup>58</sup> Working Group on Social Cost of Carbon, *Technical Update of the Social Cost of Carbon*.
- <sup>59</sup> International Monetary Fund, *Energy Subsidy Reform*.
- <sup>60</sup> Climate Change Authority, 2012. *Renewable Energy Target Review: Final Report*, CCA, Melbourne; Bloomberg New Energy Finance, *H1 2013 Australia Clean Energy Market Outlook*.
- <sup>61</sup> The emission standards for power generation and energy efficiency measures should also be adopted by the Government in the absence of a carbon price that reflects the benefits long-term action on climate change and overcome barriers to efficient low carbon investment.
- <sup>62</sup> This would have the additional benefit of allowing continued development of renewable energy in a market of flat electricity demand growth. See Tim Nelson, 2013. *Analysing clean energy markets*. Presentation at Clean Energy Week, 24 July, AGL, Sydney.
- <sup>63</sup> Daniel Lashof et al., 2013. *Closing the Power Plant Carbon Pollution Loophole: Smart Ways the Clean Air Act Can Clean Up America's Biggest Climate Polluters*. Natural Resources Defense Council, Washington, DC.
- <sup>64</sup> SKM MMA, 2013. *Assessment of economic benefits from a National Energy Savings Initiative (ESI)*. Report for the Department of Climate Change and Energy Efficiency, SKM MMA, Melbourne.
- <sup>65</sup> European Commission, 2012. *Climate Action: Questions and Answers on the proposals to reduce CO2 emissions from cars and vans further by 2020*. Memo12/548, EC, Brussels.
- <sup>66</sup> Osamu Kimura, 2010. *Japanese Top Runner Approach for Energy Efficiency Standards*. SERC discussion paper, Central Research Institute of Electric Power Industry, Tokyo.
- <sup>67</sup> ClimateWorks Australia, 2013. *Industrial Energy Efficiency Data Analysis*, Summary and factsheets, ClimateWorks, Melbourne.
- <sup>68</sup> Select Council on Climate Change, 2012. *National Partnership Agreement on Energy Efficiency Incorporating the National Strategy on Energy Efficiency: Annual report to COAG 2011–12*. Provided to the Council of Australian Governments.